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ANNUAL REPORT

1976 & 1977

THE COMMONWEALTH OF MASSACHUSETTS

DIVISION OF FISHERIES AND WILDLIFE

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To His Excellency, Michael S. Dukakis, Governor of the Commonwealth, the Executive Council, the General Court and the Board of Fisheries and Wildlife:

I have the honor to submit herewith the one hundred eleventh and one hundred twelfth annual reports of the Division of Fisheries and Wildlife, covering the fiscal years of 1 July 1975 to 30 June 1976 and 1 July 1976 to 30 June 1977.

Matthew B. Connolly, Jr.
Director

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THE BOARD REPORTS

Bradlee C. Gage, Chairman
James Baird
Kenneth E. Burns
Martin H. Burns
Henry E. Russell
Philip Stanton
Roger D. Williams

Fiscal Year 1975-1976

Nineteen hundred seventy-six was a year of great progress in the Division of Fisheries and Wildlife and a year of noticeable change as the Division began to operate under the state's reorganization program. The Division, erstwhile Division of Fisheries and Game, which had operated as an independent entity reporting to the Governor, was renamed the Division of Fisheries and Wildlife and placed in the Department of Fisheries, Wildlife and Recreational Vehicles under the direction of Commissioner Bruce Gullion. The traditional five-man governing board was retained with power to appoint the Director and set fish and wildlife regulations. Membership was expanded from five to seven members with the two new members selected especially to represent non-game interests. It was also stipulated that one of the Board members must be a professional biologist. The transition proceeded smoothly and the new members, James Baird and Philip Stanton, have added much needed expertise.

Budgets

Great pressure was brought to bear on the budgets of all state agencies during this year. Efforts to search out additional monies centered on dedicated funds and during the closing days of the legislative session, virtually all dedicated funds were eliminated. Last-minute efforts, however, restored the Inland Fish and Game Fund and restored a functional operating budget. The Board, through the Director, and with the assistance of the State Treasurer's office, explored ways to better invest the surplus monies of the Inland Fish and Game Fund. Since the restoration of funds, it has revised its investments with major emphasis on corporate bonds.

Hearings

Besides the required annual waterfowl hearing, the Board also held hearings during the year dealing with possible changes in both wildlife and fishing regulations. Among these hearings were sessions on the primitive weapons season, falconry, the "fish for fun" concept and squirrel regulations. As a result of the wildlife hearings, new regulations on falconry were adopted and regulations governing the squirrel season were altered. Two new programs were initiated. The first was the introduction of a primitive weapons season on deer. The Board felt that there was growing interest in hunting with black powder, muzzle-loading weapons and that such a season would provide increased recreational opportunities while in no way depleting the deer population. The second innovation was the institution of a "fish for fun" or catch-and-release program under which sportsmen in certain areas could fish all day, but were permitted a creel limit of only one trout for the day. The program was inaugurated on a one-year trial basis.

Land Acquisition

The program of continued land acquisition proceeded as monies became available for wetland and upland purchases. Land acquisition has long enjoyed strong support from the Board as such acquisitions reflect the Board's conviction that well-placed wildlife management areas are an important part of the Division's programs. This year marked a strong start in the acquisition of large tracts in the Hockomock area and in the Central and Western Districts.

Appointments

During 1975 James Shepard, director for many years, resigned to accept a position with Ducks Unlimited. After careful search, the Board appointed Deputy Director Colton H. Bridges as director recognizing a long career in which Mr. Bridges demonstrated both professional and administrative expertise. Richard Cronin, with a valuable and varied background within the Division, was appointed superintendent.

Fiscal Year 1976-1977

Fiscal 1977 was another year of great change within the Division marked again by a change of director and exploration of new program directions. This year the major innovation was year-round fishing.

Progress during the second year of reorganization was smooth and there was close cooperation between the Division and the office of Commissioner Gullion. The enlarged Board continued to function well and legislation for management of non-game species came closer to reality. The Division dealt with the problems caused by the wreck of the tanker "Argo Merchant" and the resulting oil spill. It should be noted that the Division was at its best during this crisis actively involved in the waterfowl clean-up and coordinating the many groups assisting in the effort.

Personnel

During the fall, the Board was faced with the resignation of two top administrators, Director Colton H. Bridges and Deputy Director Arthur Neill, who left to join Ducks Unlimited. Following their departure, the Board appointed Lewis Schlotterbeck, a career employee, as deputy director and initiated an extensive search for a director. After weeks of evaluating applications and a day of interviews with a number of excellent candidates, a new director was appointed. He is Matthew B. Connolly, Jr., formerly director of Coastal Zone Management and an outstanding administrator. Although the appointment was made from outside the Division, the strength of the Division was proven by the fact that several individuals from within the agency applied for the position and showed qualifications which warranted careful consideration.

Hearings

The annual waterfowl hearing in August produced no drastic changes. The prevailing "split season" was continued as the Board strove to maintain a functional compromise between the western area desire for early hunting and the desire of sportsmen in coastal areas for a late hunting season. The Board also held a hearing on game regulations. Minutes of this meeting are on file and the resulting changes are reflected in the 1978 abstracts.

The major change came with the introduction of the year-round fishing season and the resulting elimination of "opening day". Informational meetings were held across the state as Division personnel met with interested clubs and sportsmen's leagues. The change was instituted after a public hearing with the understanding that this constituted a relatively drastic change of traditional patterns and that this change was to be monitored carefully. A great deal of information was gathered and awaits analysis and evaluation.

Land Acquisition

The Board met almost monthly with Floyd Richardson, Chief of Wildlife Lands, to review the Division's land acquisition efforts. Over 4,000 acres have been acquired in the Hockomock Swamp area. Large tracts have been purchased in the Berkshires and in the Central District. As more and more land within the Commonwealth is developed, increased hunter pressure is brought to bear on areas remaining open and the importance of the Division's wildlife management areas becomes increasingly apparent. It is fortunate that during the last few years of tight budgets, the Inland Fish and Game Fund had the surplus needed to continue the Division's active land acquisition program.

In summary, the transition from Director Shepard to Director Bridges to Director Connolly has been smooth. The Division is financially strong. With the continued cooperation of the sportsmen, the legislature, and other state agencies, the Division of Fisheries and Wildlife continues to move ahead.

Paul S. Mugford
Senior Land Use Planner

A formal commitment to initiate a continuous planning effort by the Division in 1975 led to the creation of a new position--Senior Land Use Planner. With this step, the Division recognized the value of an ongoing planning program to provide constant administrative and management guidance in establishing agency goals and objectives and to monitor and redirect agency progress toward their attainment. Coincidentally, the Division for the first time became a major partner in the Commonwealth's Statewide Comprehensive Outdoor Recreation Plan (SCORP) which unifies and guides statewide efforts to provide for all major forms of outdoor recreation. The state plan (SCORP) thus addresses the needs and problems of an important segment of outdoor recreationists--those who are users of the wildlife resource.

Massachusetts Fish and Wildlife Resources

The Division's planning effort began with a complete inventory of the state's wildlife (vertebrates) which identified 489 species of fish, birds, mammals, reptiles and amphibians found in the Commonwealth. This large and varied resource includes 112 species which are used commercially or for sporting purposes--38 fish, 27 mammals, 44 birds, one reptile and two amphibians--and 377 others classified as "non-game". The inventory included related data on Massachusetts fish and wildlife including species distribution, relative abundance, manner of utilization, identification of those increasing and decreasing in abundance or extending their range, those present in only limited numbers and those creating nuisance or economic problems. This complete inventory was published in 1975 as one element of the Statewide Comprehensive Outdoor Recreation Plan (SCORP) under the title, "An Inventory of Massachusetts Fish and Wildlife (Vertebrate) Resources".

An Inventory of Fish and Wildlife Habitat

As proper habitat is the key to fish and other wildlife abundance and diversity, an examination of this important resource was accomplished during 1976 as a second major segment of the state plan. In a state generally considered "urban", with a population of 5.7 million people and a human density of over 700 people per square mile, it was found that Massachusetts has a reasonable amount of good fish and wildlife habitat with a surprisingly high potential for improvement. Inland fishing waters of the state amount to 173,666 acres of which 158,759 are ponded (ponds, lakes, reservoirs) and 14,907 are flowing (rivers, streams). About 123,667 acres of all inland waters are accessible for fishing and some 49,999 are not available. Unusable waters include posted private waters, closed public water supplies and those with pollution problems. The greatest potential for increasing public fishing opportunities lies in development of new fishing opportunities on closed water supplies and in pollution abatement efforts.

Existing wildlife habitat acreage in Massachusetts, based upon vegetative cover and land use criteria, has been found to consist of the following:

Agricultural or Open Land	Forest Land	Wetland	Land for Mining or Waste Disposal	Urban Land	Recreation Land
686,733	3,272,302	362,165	34,217	782,916	60,921

Total land in Massachusetts: 5,199,254 acres

Documented changes in recent years indicate increases in land devoted to urban uses. Since 1950, urban land grew from 8.1 percent of the total land area to over 15 percent--an 87 percent increase. At the same time agricultural land, providing important wildlife habitat for many popular wildlife species, sustained about a 40 percent loss, declining from 20 percent of the total in 1951 to only 13 percent in 1971. Forest lands lost to urbanization and other uses have largely been replaced by the reversion of open lands to forest so that nearly two-thirds of Massachusetts remains forested. Similarly, some losses of wetlands in recent years have occurred, but such losses have been largely offset by creation of new wetlands by governmental agencies, agriculturists and private homeowners.

Urbanization has had negative effects on wildlife-related recreation in two ways:

1. Additional development in suburban and urban areas has destroyed wildlife habitat and thus, wildlife itself.

2. Loss of wildlife habitat (former fields, forests, wetlands) has diminished the amount of recreational space that can be shared by people.

A study of individuals and groups that control fish and wildlife habitat in Massachusetts reveals that about 70 percent of all wildlife habitat in the Commonwealth is under control of agencies and interests that traditionally have had natural resource responsibilities and whose programs generally provide direct benefits to wildlife.

Major Custodians of Fish and Wildlife Habitat in Massachusetts

Owner or Controlling Agency	Acres of Wildlife Habitat
State Agencies	405,498
Municipalities	221,987
Federal Agencies	82,806
Private Recreational, Sporting Organizations	88,253
Non-Profit Conservation, Social Organizations	29,326
Counties	600
Farmers	600,000
Forest Industries	30,100
Corporate Commercial Forests	230,300
Private Commercial Forests	1,918,300
Total	3,607,170

This study of wildlife habitat exposes strengths and weaknesses and reveals trends that have obvious implications for acquisition and management of lands by the state. The study was published by the Division in 1976 as an element of SCORP under the title, "A Look at Fish and Wildlife Habitat in Massachusetts".

How Massachusetts Uses, Values and Needs Its Fish and Wildlife

A third element of the agency's plan, completed in 1976, thoroughly examined traditional and new ways in which fish and other wildlife meet human needs. Human needs involve both consumers and non-consumers. Massachusetts consumer interests having direct ties to wildlife include the licensed and unlicensed hunters, fishermen and trappers, bait dealers, researchers and owners of shooting

preserves. Hunters, fishermen and trappers together number about 750,000. Most of them reside and enjoy their recreation in non-urban areas. Their recreational activities, which are wildlife dependent, involve millions of others: administrators, licensors, legislators, enforcement personnel, sporting goods dealers and manufacturers, and those in service professions. As renewable resources, fish and wildlife are managed to yield food and fur useful in the manufacture of garments, toys and other products. In terms of food, Massachusetts wildlife is harvested in annual numbers exceeding four million with a total poundage of meat and fish of over two million at an estimated market value of $3,244,677.

The annual fur harvest in Massachusetts is currently valued at around one-half million dollars consisting of upwards of 75,000 pelts. The three most valuable species in terms of net value are muskrat, raccoon and beaver. From a purely utilitarian aspect, Massachusetts wildlife used consumptively has an average annual market value between three and four million dollars.

Many Massachusetts residents, other than consumers, benefit from the presence of wildlife in intangible ways. Members of organized groups established for birdwatching and study number around 5,000 and another one-half million are involved with feeding of birds. Thousands of residents have heavy investments in sporting dogs trained and used on wildlife, and each year an estimated 67,000 visits to state wildlife management areas are made for non-hunting though wildlife related purposes. The study also estimated annual visits to Federal wildlife refuges in Massachusetts at 350,000 and to state and Federal fish hatcheries and game bird rearing stations at nearly 200,000.

The 1975-1976 studies have shown that the need of Massachusetts citizens for wildlife has not diminished. On the contrary, it is increasing. Thus, in August of 1976, a Division of Fisheries and Wildlife plan appeared that established short and long-range goals and objectives in the areas of land acquisition, fish and wildlife administration, fish and wildlife planning, fisheries research, fisheries management, wildlife research, wildlife management, engineering and development, and information-education. Program objectives include:

Aggressive land acquisition for public fishing, hunting, trapping and non-consumptive enjoyment of fish and wildlife.

Improved licensing and permit system that will reduce clerical time and errors and reduce printing costs.

Development of plans for increased production of food and fiber on Division lands that will be compatible with wildlife objectives.

Development of user aids and facilities at wildlife management areas.

Improvement of cultural methods to effect cost savings in fishery programs.

Expansion of anadromous fish restoration efforts for major rivers.

Improved capability to census and monitor wildlife populations.

Better hunter distribution to improve the quality of the recreational experience, safety and success.

Surveying of Division properties and marking all boundaries.

Expansion of program to improve public understanding of the values of fish and wildlife and the role of management in the proper conservation of these resources.

Improvement and expansion of methods to disseminate fish and wildlife news to various communications media.

Clearly, the contribution of Massachusetts fish and wildlife resources to the recreational, economic and commercial needs of the public is significant.

FISHERIES

Peter H. Oatis
Chief Aquatic Biologist

Fiscal Year 1975-1976

During Fiscal Year 1975, fisheries programs concentrated on evaluating existing trout management programs, establishing strains of sea-run trout and northern pike, monitoring the movements and passage of anadromous fish in the Connecticut and Merrimack Rivers, as well as assessing the impact of the Bear Swamp and Northfield Mountain Pumped Storage Plants on the aquatic environment.

Coldwater Fish Investigation

The fish-for-fun (catch and release) regulations were evaluated at four public and one private stocked trout ponds. Results indicate that where the regulations are followed, as at the private pond, a substantial number of trout are effectively recycled in the sport fishery. Where public access is high such regulations are not likely to accomplish their objective unless law enforcement expends extra effort to assure compliance with the regulations. Where access is limited or in more remote waters such regulations can be effective in assuring against rapid depletions of stocked trout populations. Background information and data were collected regarding the possible effect of extending sport fishing to a year-round season.

Development of sea-run brown trout stocks focused on defining migration patterns in streams and behavior patterns of Mashpee River trout. A first group of 6500 select sea-run smolts were released in April while 21,000 sea-run brown trout eggs were taken to Sandwich Hatchery for the continuation of the selective rearing program. Initial plans for fishway development and stream improvement installation were coordinated with the Division of Marine Fisheries and Trout Unlimited.

Fishing pressure at the Quabbin Reservoir remained relatively stable although the lake trout fishing declined to 962 fish, the lowest catch in four years. Fishermen reported the release of large numbers of sublegal fish. These fish should contribute significantly to the 1976 and 1977 fisheries. The catch of rainbow trout fell almost in direct proportion to the decrease in stocking levels. This should improve in 1976.

Fisheries survey crews assessed the fauna and resource potential of the Nashua River Watershed. They also initiated survey work on the Hoosic and Farmington River Watersheds.

Work began on a final report summarizing eight years of rainbow trout and brown trout-alewife forage relationships at Hathaway Pond, Barnstable, and Higgins Pond, Brewster. Plans were formulated to

determine the forage relationship between brown trout and smelt in recently reclaimed ponds.

Warmwater Fish Investigations

Studies concerning the population dynamics of smallmouth bass in Quabbin Reservoir were initiated. The information gleaned from this project should provide facts that will assist fisheries managers in formulating better bass management programs throughout the state.

Winter creel surveys demonstrate a sustained interest in the northern pike fishery at Brimfield Reservoir. In conjunction with this program, minimum legal lengths for pike were increased to 28 inches, while the daily creel limit was dropped to two pike per day.

Initial plans and contacts were made with various lake associations and conservation commissions for the purpose of enlisting and training volunteer technicians who would assist Division biologists and district managers in evaluating ongoing fisheries programs.

Pumped Storage Power Plant Investigations

The second full year of post-operational investigations at the Northfield plant and first year of post-operational investigations at Bear Swamp were completed. Both investigations include analysis of creel survey data, monitoring shifts in invertebrate populations and water quality as a means of evaluating the alterations in the fisheries of the Connecticut and Deerfield Rivers stemming from the construction and operation of these power projects.

Connecticut River Anadromous Fish Restoration

Record numbers of shad, 346,725, were passed over the Holyoke Dam this year. More fish were passed with less stress and mortality as a result of improvements and modifications made by Holyoke Water Power Company. Tagging studies show that delay during shad migration was reduced approximately 80 percent because of fishlift improvement.

Approximately 9,000 Atlantic salmon were released from the salmon imprint release pools on Tarkill Brook, Agawam, Massachusetts. While the salmon smolts were in the release pools, mortality was kept to a minimum, but vandalism still remains a major concern.

Two returning adult Atlantic salmon were captured at the Holyoke fishlift facilities this year -- 23-pound, 40-inch female and an 8.5-pound, 32-inch male. Both were transported to the Berkshire National Fish Hatchery. The female died shortly after being transferred to the hatchery while the male was used to fertilize approximately 41,000 Atlantic salmon eggs of Penobscot River females. These eggs will be stocked into the Connecticut River as two-year smolts.

The four Connecticut River Basin states and Western Massachusetts Electric Co. entered into formal hearings before the Federal Power Commission relative to fishways needed at Turners Falls Dam -- the next barrier to anadromous fish above Holyoke. Midway through the hearing, the parties agreed to an out-of-court settlement that called for two fishways to be completed by 1981 and the third by 1984. Preliminary negotiations have been initiated between the four Connecticut River Basin states and New England Power Company relative to fishways at Vernon, Bellows Falls, and Wilder Dams.

Merrimack River Anadromous Fish Restoration

Monitoring of the Lawrence fishway has shown that a remnant shad run still exists in the lower portion of the Merrimack River. Several shad entered the fishway but none were observed successfully negotiating this antiquated facility.

In an attempt to determine if shad spawning and nursery habitat still exists in sections of the Merrimack River, this Division, assisted by the Massachusetts Division of Marine Fisheries and the New Hampshire Fish and Game Department stocked over 6 million fertile shad eggs from the Connecticut River in the Hooksett Pool, Hooksett, New Hampshire. Hatching success was between 55 and 65 percent.

For the first time in many years, Atlantic salmon were stocked in Massachusetts waters of the Merrimack River. Approximately 2,200 pre-smolts were reared for four weeks in floating stockout pens placed in the Artichoke River, Newburyport, Massachusetts. We will be able to determine just how successful this planting was by the numbers returning in 1978.

Fiscal Year 1976-1977

During Fiscal Year 1976 fisheries programs concentrated on assessing the impact of new fisheries regulations, negotiating with power companies with respect to fishway installations, and assessing the success of selectively reared sea-run brown trout. Additionally, we continued to monitor northern pike and smallmouth bass populations and completed investigations relative to the Northfield and Bear Swamp Pumped Storage projects.

Coldwater Fish Investigations

Creel survey counts were conducted by aerial observation at 18 selected stocked trout ponds for the purpose of determining angler use in response to the new year-round fishing season. Additional surveys will be completed shortly.

Continued investigations on the Mashpee River indicate that the progeny of selected sea-run brown trout are growing and surviving

significantly better than previous races of brown trout of hatchery origin.

In the neighboring Quashnet River, excellent progress is being made with the local chapter of Trout Unlimited with respect to installation of stream improvement devices.

Smelt were reintroduced to recently reclaimed Higgins and Hathaway Ponds in combination with fingerling and yearling brown trout. It is believed that this combination of forage and predator may significantly enhance the growth rates of brown trout.

Angling pressure remained about constant at Quabbin Reservoir; however, the catch rate and total weight harvested were down 28.7 and 14.3 percent from 1975. The lake trout catch increased to 1,799 or very near the 1974 level. Fishermen continued to release high numbers of sublegal lakers indicating good fishing for the next few years.

Fisheries survey crews assessed the fauna and resource potential of the Hoosic and Farmington River Watersheds and initiated a biological survey of the Westfield Watershed.

Warmwater Fish Investigations

Smallmouth bass studies at Quabbin Reservoir indicate very little mixing of the population of bass inhabiting the fishing and non-fishing areas. Most Quabbin smallmouth do not enter the legal fishing area until they are approximately four years old. Growth rates in the open fishing area exceed those in the closed fishing area.

Despite the fact that only an estimated 31 legal northern pike were removed from the Brimfield Reservoir complex, angler pressure and interest are high. Approximately 14,000 hours of angling were enjoyed during the ice fishing season. This represents about a quadrupling of the effort expended in the winter fishery prior to the introduction of northerns. Northern pike were also introduced into Quaboag Pond. To date, however, there is no evidence of successful reproduction.

Initial investigations on Lake Wyman and Lake Cochituate using Division-trained volunteers are progressing well. To date these volunteers have conducted and are in the process of monitoring various physical, chemical, biological and social parameters that will provide the necessary data upon which to base future management decisions.

Pumped Storage Plant Investigations

The final year of post-operational investigations at the Northfield and Bear Swamp Pumped Storage Projects were completed. Final reports and recommendations are being prepared. With respect to the Bear Swamp project on the Deerfield River, cold water releases of a

a minimum low flow of 100 c.f.s. will go a long way toward insuring higher quality trout fishing opportunity.

Connecticut River Anadromous Fish Restoration

Approximately 203,000 shad were passed over the Holyoke Dam this year. This indicates that roughly 65 percent of the shad population entering the mouth of the river were passed over the Holyoke Dam. Thirty other fish species, totaling 114,300 fish, were also observed being passed into the Holyoke pool.

Creel surveys conducted below the Holyoke Dam and Turners Falls Dam indicate that a total of 8,300 shad were harvested by 9,265 anglers during 20,337 hours of fishing. This represents slightly better recreation than during the past few years.

Approximately 114,500 Atlantic salmon pre-smolts, weighing nearly eight tons, were released into the Connecticut River Basin this year. From this allotment 28,000 were released in the vicinity of the Holyoke Dam. The exit channel at the Holyoke fishway was used as the imprint release site, instead of the pools at Tarkill Brook as last year.

Seven returning adult Atlantic salmon have been reported this year; one found by a commercial shad fisherman, three taken by sport anglers, two seen at the Holyoke fishlift, one found dead above Holyoke Dam. Of these seven fish, three were reported dead and four were transported to Berkshire National Fish Hatchery for fall spawning.

Negotiations with New England Power Company and the four basin states concerning fishways at Vernon, Bellows Falls, and Wilder Dam appear to be progressing satisfactorily.

Merrimack River Anadromous Fish Restoration

The Lawrence fishway was again monitored and while shad were observed entering the facility none were seen to negotiate its entire distance. Negotiations between the dam owners and fisheries agencies have begun concerning improving and constructing new fishways. Funding appears to be the major problem .

Approximately 1,677,500 fertile shad eggs were placed into the Merrimack River above Lowell. Hatching success was observed to be 50 percent. This indicates viable spawning habitat.

This spring 32,000 Atlantic salmon smolts were stocked directly into the Merrimack River above the Lowell Dam. All of the fish were marked with a cold brand for identification.

FISH HATCHERIES

David Fredenburgh
Chief Fish Culturist

Fiscal Years 1975-76 and 1976-77

Facilities

During the past two years the hatchery system has been actively engaged in new construction and upgrading existing facilities. With the exception of building a new hatchery in 1969, little money has been spent for maintenance or construction of fish hatchery facilities. Deterioration of the stations had become noticeable. Within this time, the Montague hatch house caved in. Ponds and raceway systems at Palmer were undercut by water, and the hatch house at Sunderland sagged. Although there were no major fish kills it became increasingly difficult to operate the hatcheries. Thus, in 1975, development was given high priority and by June 1977 all of the hatcheries had some improvements.

McLaughlin: Domestic water system revamped; refurbished four vertical turbine pumps; preliminary and final design of pollution abatement facilities.

Montague: New storage - office building.

Palmer: New rearing system for hatch house; new water distribution system for hatch house and outside pools; new fiberglass above-ground tanks; site improvement for location of outside pools; new well, pump and piping to hatch house. The Division is currently in the process of installing an ultra-violet light and filtration system for the reservoir water.

Sandwich: New well to supply hatch house; new hatch house.

Sunderland: New septic system for the hatch house.

During 1975-1977 some policy guidelines were developed regarding production capabilities and the location for propagating various species of trout/salmon. The Sandwich Hatchery will be responsible for rearing coho salmon and sea-run trout along with the normal production of brown, brook and rainbow trout. The Palmer Hatchery will be responsible for rearing Atlantic and landlocked salmon only. Kokanee salmon will be raised at the Sunderland Hatchery for the near future. Due to the excellent facilities at McLaughlin, this hatchery has taken on part of the responsibility for the actual hatching and early rearing of trout. At the present time, most of the trout eggs

hatched at Division facilities come from the Federal government or are purchased from private sources. The McLaughlin Hatchery is presently developing a program for brood stock of brown and brook trout that are apparently resistant to furunculosis, a bacterial disease. The Sandwich Hatchery also maintains a brood stock program.

One of the biggest problems facing the hatchery system is encroachment by housing developments. This raises problems of sewerage disposal as a potential pollutant to ground water supplies, heavy demand on ground water, vandalism to the buildings and equipment, and poaching. During the past two years, there have been two instances of conflict. Housing developments have been proposed for lands adjacent to the Montague and Sunderland Hatcheries. The Division has actively opposed such developments and, to date, there has been no construction. The Division has been in contact with various citizens' groups about pollution from the McLaughlin, Sunderland and Sandwich Hatcheries, and the Division is currently exploring possibilities for funding a pollution abatement facility at McLaughlin.

Stocking

With the advent of the "year-round" fishing season, more emphasis is being placed on fall stocking. Through manipulation of strains and hatching time, hatcheries will be able to alter production schedules to include a fall stocking program.

Costs

The past two years have brought an increase in costs for the production of trout and salmon. The increase in the cost of energy has had a direct bearing on fish rearing costs through such items as electricity to pump water, heating oil and gas, and gasoline to run vehicles. The collective bargaining law has increased salaries and overtime pay thereby adding to the financial load of the stations. Feed costs have increased approximately 40 percent during 1975-1977. The hatchery system has tried to reduce these increases by better scheduling of manpower, more efficient distribution of trout, decrease of heating and electrical costs and re-evaluation of the product raised. The Division is currently working toward raising a strain of trout that matures rapidly and that attains 9"+ stocking size in 18 months rather than the traditional 27 months. Efforts are also being directed toward development of a strain that will be highly resistant to hatchery mortality.

WILDLIFE

Chet M. McCord
Chief of Wildlife Research

Fiscal Year 1975-1976; 1976-1977

Statewide Small Game Harvest

A sample of 400 hunters (consisting of two subsamples of 200) licensed in 1975 was surveyed by telephone to determine their harvest and participation in small game hunting. Additional special questions concerned deer and squirrel hunting.

Hunter effort was greatest for pheasant, ruffed grouse, cottontail rabbit, woodcock, and ducks. Hunter success was greatest for pheasant, cottontail rabbit, ducks, ruffed grouse, and gray squirrel. Estimated harvests were greatest for ducks, cottontail rabbit, raccoon, pheasant, and gray squirrel. Due to the structure of the sampling procedure, sample totals may not accurately represent actual totals. However, useful trend information can be established.

The estimated number of Massachusetts deer hunters was calculated as 66,684 ± 4.7 percent. Shotgun hunters ranked first (97.8%), with archery and primitive firearm hunters both comprising approximately 7.5 percent of the total. The sample estimate of 5,474 successful antlerless permit applicants was not significantly different from the actual total of 5,570.

Most hunters had no opinion regarding the length of the squirrel season. The majority (79%) of those desiring a change wanted an earlier opening date.

Another sample of 400 hunters was surveyed in 1976. Analysis of the results of this survey is in progress at the time of writing this report.

Beaver

A total of 1,135 beaver was taken by 107 trappers in 103 towns during the 1975-1976 beaver season. This take is significantly less than both the 1974-1975 take and a ten-year (1966-1975) take. Harvest trends from 1967-1971 to 1972-1976, however, significantly increased in all counties and regions. The estimated harvest valuation was $21,565. During the 1976-1977 season, a total of 1,558 beaver were taken by 144 trappers in 119 towns. This represents an increase in harvest in all major counties and regions and a significant increase in Franklin, Hampshire, and Worcester Counties and the statewide total. The estimated harvest valuation of $45,057 is the greatest since beaver trapping was initiated in 1952.

Otter and Fisher

New regulations instituted in 1976 required all successful otter and fisher trappers to submit their pelts to an official checking station for examination. Voluntary turn-in of the carcasses of these species was requested at the same time.

A total of 110 otter was taken by 65 trappers in 59 towns as opposed to 103 taken in 1975-1976 (based upon fur dealer reports); Nearly half

(50 otter) were taken in November, with two-thirds (73 otter) taken in Conibear traps. A total of 23 fisher (plus two live-trapped for zoological purposes) were taken by 17 trappers in 17 towns, as opposed to two known taken in 1975-1976. About half (12 fisher) were taken in February, with 13 taken in leghold traps.

Mourning Dove

In 1976 and 1977, calling doves were counted on three randomized routes in cooperation with the U. S. Fish and Wildlife Service's annual mourning dove breeding population census. The total number of calling doves in 1976 decreased 52 percent from 1975 counts on two comparable routes. Data from one route were not available for 1975 and could not be compared. In 1977, the total number of calling doves on all (three) comparable routes increased 35 percent over 1976 counts.

Quail

Sixteen whistling-count quail census routes were conducted in three counties in 1977 of which 11 were comparable with routes surveyed in 1975. Preliminary analysis indicates no significant change in call indices in Bristol, Plymouth, and Barnstable Counties from 1975 to 1977. Increased background noise hinders the continued effectiveness of the whistle-count survey.

Turkey

In 1975-1976, turkeys in the Beartown State Forest showed increased signs of dispersal from the release area. Reports were received from several towns south and west of Beartown State Forest. Reports of turkeys to the north may include dispersed birds from releases in New York and Vermont. Broods were produced in at least two locations on and adjacent to Beartown Forest.

In 1976-1977, Beartown area turkeys continued to show signs of production and dispersal. Reports in several new areas seem reliable, but need verification. Reports continue in northern Berkshire and adjacent Franklin County. Reports from Hampden County probably represent escaped penned stock.

Black Bear

In 1975-1976, applications for bear hunting permits were received from 483 sportsmen. Three bears, reported as females, were taken during the open season and two additional bear were illegally shot during deer week. New reports of 41 observations totalling 52 bear were received from five counties. Two reports of problem bears were investigated.

In 1976-1977, applications for bear hunting permits were received from 430 sportsmen. Three bear, again reported as females, were taken during the open season and one male was illegally shot during deer week.

One road kill was reported. New reports of 13 observations totalling 12 bear were received from 10 towns. Results of the bear historical study and preliminary information from the population dynamics study were published as Research Bulletin 18, "The History and Status of the Black Bear in Massachusetts and Adjacent New England States".

Deer Research Project

The 1976 statewide deer harvest for all deer seasons was 2,712 deer. During the 18 day archery season (8 November through 27 November) the archers harvested 94 males and 33 females or 127 deer. Hunters using primitive firearms harvested 49 deer (20 males and 29 females) during the three day hunt December 20 through December 22. Paraplegic deer hunters harvested one male and one female during the special two day season on Martha's Vineyard. During the six-day shotgun only deer season, December 6 through December 11, hunters reported taking 2,534 deer. Of these 1,812 were males and 722 were females.

The 1977 statewide deer harvest for all deer seasons was 3,207 deer. Archers took 142 deer (103 males and 39 females) during the 18 day season November 7 through November 26. During the primitive weapon season December 19 through December 23 hunters harvested 64 males and 65 females for a total of 129 deer. There were no deer harvested during the special two day season for paraplegics. During the shotgun only deer season (December 5 through December 10) hunters reported 2,936 deer. Of these 2,151 were males and 785 were females.

Non hunting deer mortalities compiled during 1976 and 1977 are as follows:

Mortality Cause	Number of Deaths in 1976	Number of Deaths in 1977
Automotive	296	341
Dogs	58	73
Illegal	48	57
Drowned	5	2
Other & Unknown	35	38
Total	442	511

Falconry

In 1975-1976 the Division licensed 18 falconers of which three were master falconers. In 1976-77 the number increased to 23 of which five were master falconers. The most commonly used birds were the Red-Tailed-Hawks and the Goshawks. During this period Massachusetts' Falconry Regulations were rewritten to comply with existing Federal Regulations.

Gosling Transplant Program

During fiscal year 1976, 43 goslings were transplanted to two sites in Central and Western Massachusetts; 27 other geese were banded and released on the capture sites. The following year only 20 goslings and two adults were transplanted to a single site.

Goose flocks in the Framingham-Southboro area have declined from a high of 191 in 1973 to 110 in 1976. Breeding geese were observed or reported at eight areas on or near former release sites during 1976 brood checks. No brood checks were conducted in 1977.

Preseason Waterfowl Bandings

With the airboat back in operation, preseason banding efforts got back into high gear after a two year hiatus. A total of 1,513 waterfowl and other birds were banded. This included 160 ducks banded as part of the Division's park waterfowl study. 209 wood ducks and 151 black ducks were banded in the wild. The remaining birds banded included a wide variety of waterfowl and other birds.

In 1976, 1,502 birds were banded including 502 wood ducks and 143 blacks. The final year of park waterfowl banding netted 169 ducks.

Winter Inventory Flights

Winter inventory routes were flown during the first full week of January in 1976 and 1977. Biologists surveyed all of coastal Massachusetts from New Hampshire to the Rhode Island line. The total waterfowl count in 1976 was 121,016 - up 0.6 percent over 1975 and 14.6 percent over the 10 year average. Black duck numbers (17,800) were up 11.5 percent over 1975 but were down 18 percent from the 10 year average. Scaup, sea ducks and Canada goose numbers were down from 1975 while mallard, golden eye, bufflehead and merganser numbers were up. In 1977, 116,166 waterfowl were counted, 4 percent less than in 1976 but 7 percent over the previous 10 year average. Black duck numbers (19,690) were up 11 percent over 1976 but down 5 percent from the 10 year average. Scaup, mallards, sea ducks and Canada geese were down from the previous year while goldeneye, bufflehead, canvasback and merganser numbers were up.

Winter Trapping Program

During 1976, a total of 1,713 birds were banded. This included 620 blacks, 46 mallards, 91 mallard X black hybrids and 15 pintails taken during coastal trapping operations and 769 mallards, 39 hybrids, 45 blacks, 5 wild X domestic hybrids and 33 American coot trapped during this last year of park waterfowl banding operations. The winter of 1976-7 was exceptionally cold causing starvation conditions for some waterfowl. Because of this birds responded well to bait and 1,472 black ducks, 359 hybrids, 56 mallards, 9 pintail, 8 wigeon and 1 wood duck were banded during coastal trapping operations.

Black Duck Imprint Program

No releases of black ducks were made after 1975. Nesting checks of elevated cylinders in 1976 indicated that 7 black duck, 3 mallards and one hybrid nested in them. All but two black duck nests were successful. The first unbanded black duck was recorded nesting in 1976.

During the spring of 1977, 4 black duck and 3 mallards nested in cylinders. This project is completed and a 5 year summary will be submitted for publication.

Park Waterfowl Investigations

The park waterfowl project was inactive during fiscal years 1976 and 1977 except for the banding described earlier.

Wood Duck Dump Nesting Study

Field testing to determine collar retention rates on color marked wood ducks and early morning nesting observations were conducted during the springs of 1976 and 1977. The tests indicated that collar loss was an insignificant factor and return rates indicated the collars did not affect hen survival. Ten dump nesting hens were observed and their actions recorded. Preliminary data indicate that most hens that dump eggs in other nests eventually establish nests of their own.

Evaluation of Starlingproof Nestings Structures

A summary of 6 years of comparative wood duck usage of cylinders and wooden boxes was published in The Wildlife Society Bulletin in the spring of 1977 (Vol. 5 No. 1 pp 14-18). Further checks of starlingproof cylinders conducted incidentally to other work in 1976 and 1977 indicated no significant changes in use. This segment of the research project is now finished. Various skylight lids were tested during 1976 and 1977 but investigators found no significant difference in wood duck acceptance of light lid boxes and boxes with regular lids, nor was there any difference in the rate of abandonment, although birds in boxes equipped with light lids were flightier than those in the control boxes. Starlings use light lid boxes significantly less frequently than control boxes. This difference was especially pronounced on the eastern Massachusetts study areas.

Release of Hand Reared Wood Ducks

No hand reared wood ducks were released in 1976 or 1977. Two hens released in 1975 nested on Quabbin beaver ponds in 1976 along with one unbanded bird. No hand reared wood ducks were recorded at Turkey Hill Brook in 1976 but a hen released in 1975 was captured in late summer night-lighting operations. She appeared to be in company of a brood.

Despite a prolonged power failure that resulted in loss of ducklings and eggs in May, over 60 wood ducklings were raised in the Ayer Game Farm duck pen. Some of these ducklings will be released on Quabbin beaver ponds during late summer 1977.

Coastal and Inland Wetlands Survey

Chromatic enhancement of wetland cover types on black and white topographical sheet was used in the first stage of identifying potential waterfowl habitat.

Management of Wildlife Areas

There were three areas of effort in the project during 1975-1977; improvement of habitat, providing public access, and providing information for Management Area users.

Wildlife Habitat Management:

Division personnel created a five-acre wetland, built 350 new wood duck nesting boxes, and maintained 1000 others. Under this project Division personnel planted approximately 1300 trees and shrubs and planted cover on 250 acres of wildlife "openings". An additional 325 acres were treated so that the land would remain open and that sprout growth would be encouraged. 165 acres of woodland were cut selectively and an additional 100 acres were cleared to create new open areas. Management plans were completed for three wildlife management areas.

Public Access

Division personnel constructed 16 miles of trails and maintained 100 miles of roads and trails. Seven new parking areas were constructed and 45 existing parking areas were maintained. In addition, 15 blinds were constructed on two waterfowl areas.

Information Aids

Division personnel constructed 550 signs and marked 21 miles of new boundaries. They also maintained 1500 existing signs and 190 miles of previously marked boundaries.

GAME FARMS

E. Michael Pollack
Chief Game Biologist

Fiscal Year 1975-1976

Routine maintenance was performed at all farms. Vandalism continued at the Sandwich Game Farm.

High feed costs still plague all game farm propagation efforts as well as those of commercial game bird raisers. Increases in the price of soybeans and corn have caused and perpetuated the sharp rise in feed costs. Other increased costs are reflected in the purchase of poultry netting and other supplies.

Potential disease problems have been monitored carefully at all game farms.

CETA employees from the Gardner area assisted in improving bird-rearing facilities.

Stockings during this fiscal period were as follows:

Pheasants (cocks only)

	SR	B	C	PG	Misc.	Total
Sandwich	130	2,064	2,456	8,028	--	
Wilbraham	1,685	4,264	6,780	5,321	50	
Ayer	2,848	3,332	5,940	14,006	100	
	4,663	9,660	15,176	27,355	150	57,004*

Quail

A total of 3,150 were released including approximately 400 used in field trials.

White Hare

White hare released numbered 192.

* Does not include approximately 819 field trial birds and 4,626 adult brood stock released in early summer.

Fiscal Year 1976 - 1977

During this period, all game farms suffered severe winter damage to covered holding pens resulting in a financial setback of thousands of dollars. In addition, a fire at the Ayer Game Farm, caused by electrical malfunction, destroyed part of the old farmhouse. The damage was repaired and a new wiring system installed.

The spiraling cost of game bird feed continued its upward path. The main cause of the feed increase was the market fluctuation of protein foods, particularly soybeans and corn. Feed costs increased 26 to 33 percent during this one year.

Mortality due to disease, vandalism, and so forth was moderate.

Maintenance at the Ayer Game Farm was accomplished with the aid of CETA program employees. Limited summer help was available at the Wilbraham and Sandwich Game Farms.

Releases were made as follows:

Pheasants (cocks only)

	SR*	B*	C*	PG*	Misc.	Total
Sandwich	100	2,196	4,948	7,116		
Wilbraham	2,225	5,092	6,052	5,324	91	
Ayer	2,118	2,740	5,328	15,620	192	
	4,443	10,028	16,328	28,060	283	54,699**

Quail

Quail released numbered 2,882 including approximately 500 field trial birds.

White Hare

Three hundred ten (310) white hare were stocked.

* SR - Sportsmen's Rearing program
B - Preseason stocking on private or town covers
C - Inseason stocking on private or town covers
PG - Stockings on wildlife management areas

** Does not include approximately 926 field trial birds and 3,550 adult brood stock released in early summer.

INFORMATION AND EDUCATION SECTION

Eleanor C. Horwitz
Chief of Information and Education

The Information and Education Section of the Division receives an average of 40 letters per day (10,000 a year) which require some form of disposition. Most require a response. Often the response can be a printed form, but frequently the request is one which must be answered with an individual letter. To answer these inquiries and to inform sportsmen throughout the Commonwealth of facilities and regulations, the I & E section produces and maintains a supply of abstracts of regulations for the current year, special regulations for migratory waterfowl, a list of stocked waters in the Commonwealth, and maps of 200 popular fishing ponds and 44 wildlife management areas.

To provide information on a broader basis than is possible by direct correspondence, the Division issued eleven press releases (53 items) and five "Tips to Outdoor Writers" during 1975-1976. During 1976-1977, the Section issued nine press releases (36 items) and one "Tips to Outdoor Writers". Releases and "Tips" dealt with such issues of interest and concern to the sporting public as dog-restraining orders, season openings and changes in Division personnel.

In cooperation with the Department of Commerce and Development, the I & E staff supervises the Massachusetts Sports Fishing Awards program. Under this program, awards were issued for record fish in seventeen categories.

The I & E Section also sponsored an art competition for the art work to be used on the following year's waterfowl stamp. The 1975-1976 competition was won by William P. Tyner for his rendition of Captain Osgood's Canada goose. The 1976-1977 prize was awarded again to William Tyner for his painting of a golden-eye decoy. The winning designs were subsequently printed and reproduced on waterfowl stamps.

Consideration was given to holding another competition for the art work on the archery stamp. This project was abandoned and art work was provided by a commissioned artist.

Perhaps the single major issuance of the Section during this period has been the magazine MASSACHUSETTS WILDLIFE which appears in 20-page, 6 x 9 format, with two-color interior and full color cover. MASSACHUSETTS WILDLIFE appears bimonthly and is provided free to 26,000 interested subscribers. On 1 April 1976, Wildlife Journalist Jack Clancy assumed responsibilities as Managing Editor of MASSACHUSETTS WILDLIFE. There were no issues printed between January and April 1976 because of a lack of funds and the resignation of former editor, "Ted" Williams. The remaining four issues of 1976 were printed following Clancy's appointment.

In addition to MASSACHUSETTS WILDLIFE, the Division produced one monograph, publishing James E. Cardoza's THE BLACK BEAR OF MASSACHUSETTS in 1976.

A major portion of the I & E effort was expended on visual educational material. Division photographers enlarged the file of photo exhibit material and film available for Division productions.

This material was used to meet the needs of wire services and local newspapers treating hunting, fishing and conservation issues as well as for exhibits at the Eastern States Exposition, Sportsmen's Show and many smaller shows throughout the Commonwealth. Film taken by Division photographers was used in many TV segments and filming continued on coastal islands for the cooperative filming venture between the Massachusetts Audubon Society and the Division of Fisheries and Wildlife. A number of slide presentations were put together for showing by I & E personnel as well as Division biologists. During this period, the Audio-Visual Coordinator presented 50 illustrated lectures to a variety of groups ranging from biology classes at the University of Massachusetts to civic and conservation groups. The Wildlife Journalist presented 16 programs to various groups.

During April of 1977, Massachusetts served as host for the 1977 Northeast Fish and Wildlife Conference. This required the Division's I & E staff to put forth a special effort coordinating audio-visual arrangements and participating in host activities for the many visiting fish and wildlife professionals who attended. I & E personnel assumed these duties in addition to their regular activities of providing materials for the mass media, clubs, and private citizens.

REALTY

Floyd Richardson
Chief of Wildlife Lands

The Division has long pursued an aggressive policy of land acquisition. Lands are purchased or leased to protect fish and wildlife habitat in the face of encroachment by expanding towns and to provide open areas which will afford sportsmen and others the opportunity to enjoy the fish and wildlife resources of the Commonwealth. All Division lands are open to the general public without regard to race, creed, color, sex, handicap or age. During 1975-1976, the Division acquired a total of 6,644.25 acres, bringing its total land holdings to 38,059 acres. Most lands were acquired with funds provided by a 1971 bond issue to protect wetlands, and a 500,000-dollar appropriation from the Inland Fish and Game Fund. Other lands were presented to the Division by individuals or groups. The Division gratefully acknowledges the important contributions made by these generous donors of wildlife lands.

Land Acquisition Summary

	FY 1975-1976	FY 1976-1977
Hockomock Acquisition Project	1,121.00 Acres	467.15 Acres
Fisk Meadows Acquisition Project	358.50 Acres	31.00 Acres
Nissitissit River Acquisition Project	23.20 Acres	24.60 Acres
Chalet Acquisition Project	515.00 Acres	
Squannacook River Acquisition Project	140.00 Acres	
Land Transfer (Clapps Pond)	68.35 Acres	
Birch Hill Acquisition Project		1,507.35 Acres
Bolton Flats Acquisition Project		481.30 Acres
Hinsdale Flats Acquisition Project		537.00 Acres
Windsor Acquisition Project		805.00 Acres
Stafford Hill Acquisition Project		110.00 Acres
Housatonic Acquisition Project		127.00 Acres
Rocky Gutter Acquisition Project		50.00 Acres
Crane Pond Acquisition Project		1.50 Acres
Mill Creek Acquisition Project		232.45 Acres
Quaboag Acquisition Project		8.00 Acres
Moose Hill Acquisition Project		30.50 Acres
North Shore Salt Marsh Acquisition Project		3.50 Acres
Minns Sanctuary		1.80 Acres
Lake Snipatuit		.50 Acres
Totals	2,226.05 Acres	4,418.20 Acres

Grand Total - 6,644.25 Acres

Hockomock Acquisition Project

This project has been notably successful throughout and during 1976 and 1977, acquiring an additional 1,588 acres. Since the inception of the program, nearly 5,000 acres have been acquired from more than 200 owners. This assemblage consists of acres of woodlands, marshes, meandering streams and open field, blended together forming an area which is used by practically every species of wildlife indigenous to Massachusetts. Although the megalopolis will soon engulf the surrounding area, the Hockomock will retain its unspoiled character.

Quaboag Acquisition Project

A few years ago, the Hamilton Rod and Gun Club in Sturbridge deeded a gift of 62 acres of land situated in Sturbridge and Brookfield to the Division of Fisheries and Wildlife. This gift was welcomed by the agency as it provided another area where sportsmen would be assured "a place to hunt". The acquisition of an eight-acre tract in Brookfield, contiguous with the given property, increases the size of the Division's holding and supports the Division's intent to provide "a place to hunt".

North Shore Salt Marsh Acquisition Project

A parcel containing 3.5 acres of coastal salt marsh in the Town of Newbury was purchased by the Division of Fisheries and Wildlife. This parcel is adjacent to, but does not abut, thirty-eight acres purchased by this agency in 1970.

Crane Pond Acquisition Project

This wildlife management area is located within 30 miles of Boston. An additional 1.5 acres with frontage along the Parker River was acquired to further enhance and protect valuable wildlife lands.

Lake Snipatuit

This acquisition affords parking and access for persons using Lake Snipatuit in Rochester. The lake is noted for its warmwater fisheries. Largemouth bass, pickerel, perch and bullheads inhabit this shallow lake and offer a challenge to those who desire to "wet a line".

Chalet Wildlife Management Area*

A gift of 515 acres of land was presented to the Division of Fisheries and Wildlife by Berkshire Land and Timber, Inc. The area is located in the Towns of Windsor and Dalton and is accessible from Route 9 by Flintstone Road. Mixed hard and soft woods found on this area furnish food and cover to deer, bear, rabbits, grouse, raccoons and squirrels.

Minns Sanctuary

A little under two acres of land in Princeton was given to this agency by Dr. Olive Gates. The gifted property abuts the existing Minns Sanctuary which also was received as a gift from Miss Susan Minns in 1926.

Clapps Pond (Land Transfer)

The Department of Public Works deeded 63 acres of land in Provincetown to the Division of Fisheries and Wildlife to provide an access to Clapps Pond in exchange for a gore of land in Falmouth approximating five acres.

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* Designates a new wildlife management area.

Bolton Flats Acquisition Project*

This important acquisition is located in Worcester County in the Towns of Harvard, Bolton and Lancaster. The area, once actively farmed, is bordered on the west by the Nashua River and extends easterly to the Still River with small fingers of land abutting Route 110. The initial acquisition comprises 481 acres. This acquisition project will develop into a wildlife management area second to none. The character of the land is such that it will offer something for everyone.

Hinsdale Acquisition Project*

The acquisition of 537 acres in the Town of Hinsdale, a small town in the Berkshires, is the nucleus of a new wildlife management area to be known as the "Hinsdale Flats". Mixed woodlands, alder runs, open fields and cattail marshes combine to provide food and cover for the variety of wildlife found here. The East Branch of the Housatonic River lazily winds its way through the property. Deep, dark, not-too-easily-accessible pools harbor trout to sustain fishing throughout the year.

Windsor Acquisition Project*

Prime wildlife lands were acquired to provide another wildlife management area. Eight hundred five acres, representing two acquisitions of land once devoted to farming,will now be managed for wildlife. Fields once planted to corn, alfalfa and hay to provide food for dairy herds will now provide food and cover for pheasants, deer, grouse and other wildlife.

Birch Hill Acquisition Project

Property contiguous to the lands owned by the U. S. Army Corps of Engineers (4,500 acres) and licensed to the Division of Fisheries and Wildlife, was purchased to further insure the sportsmen of future hunting and fishing lands. This acquisition, which consists of 1,507 acres, affords easy access to the total area by many paved, dirt and woods roads.

Fisk Meadows Acquisition Project

Fisk Meadows is located in the northwest section of Hampshire County in the quiet hill town of Chesterfield. Here the outflow of Damon Pond, joined by other small streams and brooks, combine to create the Dead Branch which flows through the so-called Fisk Meadow and eventually empties into the East Branch of the Westfield River. The Fisk Meadow is a wetland basin protected on three sides by precipitous woodland terrain. The Division of Fisheries and Wildlife initiated this project, recognizing the importance to wildlife of the wetland and adjoining uplands. To date, 389 acres have been acquired. The goal established by this agency to fully protect the area is nearly 50 percent realized. The fate of the remaining acreage is in the hands of the legislators and town selectmen.

Housatonic Acquisition Project

The addition of 127 acres to this important area not only increases the amount of huntable land, but provides more stream bank frontage on the Housatonic River. The lands acquired contribute hay lands bordered by hedgerows and a small wetlands area.

* Designates a new wildlife management area.

Stafford Hill Acquisition Project

During 1976-1977, the Division acquired 110 acres of rolling farmlands adjacent to the Stafford Hill Wildlife Management Area. This acquisition also provides nearly one-half mile of road frontage, further protecting the area from encroachment of home construction.

Rocky Gutter Acquisition Project

Three new parcels were acquired, adding another 50 acres to this management area. This project was reactivated to increase Division of Fisheries and Wildlife ownership in an area which threatens to become a desirable area for single residences.

Mill Creek Acquisition Project

Ox Hill Pasture, as it once was called, was purchased by the Division of Fisheries and Wildlife to increase the Mill Creek Wildlife Management Area by 232 acres. The fact that Ox Hill Pasture affords another access into the already established wildlife area and that the pasture has considerable frontage on Mill Creek and Parker River makes this an attractive and important parcel.

Nissitissit River Acquisition Project

Stream bank purchases continued in this region with 47 additional acres acquired during 1975 to 1977. An abandoned railroad line provides access. This and two other parcels which contribute road frontage and stream bank along Sucker Brook (a stocked trout stream), serve to enhance this area known for its fine trout fishing.

Moose Hill Acquisition Project

In the Moose Hill area, the Division offered a local farmer the use of 20 acres of land that could not be used for hunting because of its proximity to a road and occupied dwellings in exchange for 30 acres abutting the existing management area. The 30 acres were deeded in fee to the Division of Fisheries and Wildlife as consideration for the agricultural use of the 20-acre parcel. The parties involved all benefitted from this arrangement: sportsmen gained 30 additional huntable acres; the farmer received the use of 20 acres. Good relations were established between the landowner, the Commonwealth and the sportsman.

Squannacook River Acquisition Project

This is a continuing project in which property will be purchased to protect the Squannacook River as it becomes available. During Fiscal 1975-1976, the Division acquired a 140-acre parcel along the river. This tract contributes not only stream bank, but also valuable road frontage. The acquisition of road frontage is critical in preventing home construction which contributes river pollution through septic systems. Open road frontage protects against such pollution and also provides both undisputed access and ample parking.

WESTERN WILDLIFE DISTRICT

Winston Saville
District Wildlife Manager

Fiscal Year 1975-1976

During Fiscal Year 1976, personnel of the Western Wildlife District continued managing the areas which have traditionally been their responsibility expanding into new areas when possible. During the spring of the year, they participated in the census of woodcock and mourning doves, running three census routes for woodcock and two for mourning doves. They participated in the acquisition of two tracts of land--purchase of Fisk Meadows Management Area (358.5 acres) and the 515-acre Chalet Wildlife Management Area which was received as a gift. On lands already within the Division's possession, District personnel continued maintaining boundary markers and establishing new ones. Specifically marked, during this fiscal year, was the Forbush Sanctuary in Hancock.

In addition to the above, the District Manager or his appointed representatives participated in a variety of public functions including: judging conservation exhibits at the annual 4-H convention; providing lectures and slide shows at Berkshire Community College, the Central Berkshire School District, Lions, Kiwanis, Rotary and churches; attending meetings with the Berkshire Regional Planning Board and the U. S. Soil Conservation Service's Conservation District; participating in natural resource inventories for Berkshire, Hampden and Hampshire Conservation Districts; participating in the annual river cleanup project conducted by the Housatonic River Watershed Association; participating in National Hunting and Fishing Day activities including consulting on 25 to 30 exhibits, maintaining a fishing pond for children and sponsoring activities related to dog training and shooting safety; maintaining a permanent exhibit of Division activities at the Mount Greylock Visitor's Center operated by the Department of Environmental Management; and attending 14 County League meetings in Hampshire, Hampden and Berkshire Counties as well as 15 sportsmen's club meetings.

The District Manager also participated in the C.E.T.A. program, supervising a team of 12 C.E.T.A. workers assigned to the District during the summer months. C.E.T.A. personnel engaged in brush cutting and other forms of habitat improvement on the Housatonic and Peru Wildlife Management Areas.

During this fiscal period, Western District personnel stocked 6,278 cock pheasants, 410 hen pheasants and 230 white hare, and handled 55 nuisance complaints related to beaver.

Forty-four man days were expended on the kokanee salmon program, eight days on stream surveys, 18 days on trout creel census, 11 days on warmwater creel census, 12 days on stream access work at the Peru Wildlife Management Area, and nine days on pond chemistry surveys. In addition, ten man days were spent at fisheries meetings and 17 man days were used for building maintenance. Three man days were spent checking fish kills and pollution. The remaining time was spent on repairing, painting and maintaining fisheries equipment and tank trucks.

Western District personnel stocked 208,960 brook, brown and rainbow trout during this fiscal period. In addition to the trout, 22,200 kokanee salmon fry were released into the waters of Onota Lake in Pittsfield.

Fiscal Year 1976-1977

This year, again, the District Manager and staff pursued traditional management and community relations activities. Census routes were the same as those run during 1975-1976. Thirty-one acres were added to the Fisk Meadow Wildlife Management Area, 127 were added to the Housatonic River Wildlife Management Area and Stafford Hill Wildlife Management Area, Cheshire, 110 acres. In addition to these tracts new lands were acquired as follows: Hinsdale Flats Wildlife Management Area, Hinsdale, 450 acres; Moran Wildlife Management Area, Windsor, 800 acres.

Regular maintenance of boundary markers continued including further marking of the Forbush Sanctuary where District staff also erected large signs and brushed a small area. During the year, the District Manager and/or his duly appointed representatives judged conservation exhibits at the annual 4-H convention; presented lectures and slide talks to groups at Berkshire Regional Community College, Central Berkshire School District, Lions, Rotary and church groups; attended 15 to 20 sportsmen's club meetings and another 15 meetings of the county leagues of Berkshire, Hampshire and Hampden Counties; continued participation in natural resource inventories for Berkshire, Hampden, Hampshire Conservation Districts; served as co-chairman of National Hunting and Fishing Day program for the area, continuing the same projects detailed for the 1975-1976 period; continued maintenance of the display of Division activities at the Mount Greylock Visitor's Center.

During this period, District personnel stocked 4,881 cock pheasants and 450 hen pheasants. White hare were not available from the usual source and thus were not stocked during 1976-1977.

Fisheries personnel stocked 216,263 legal-size trout. In addition, 15,500 kokanee salmon fingerlings were released into the waters of Onota Lake, Pittsfield, and Laurel Lake, Lee. Sixteen man days were spent on the kokanee salmon program, nine days on stream surveys and 12 days on trout pond surveys. District personnel also spent 17 days on warmwater pond surveys, three days on fisheries seminars, 15 days at the Springfield Exposition, Soil Conservation Service and Berkshire Museum meetings.

An additional 30 man days were spent for building, remodeling and material salvage of properties owned by the Division.

CONNECTICUT VALLEY WILDLIFE DISTRICT

Herman Covey
District Wildlife Manager

Fiscal Year 1975-1976

The Connecticut Valley Wildlife District covers 49 towns on both sides of the Connecticut River from the Vermont-New Hampshire borders to the Connecticut state line. There are three counties in this region and the District takes parts of all three, with the remaining towns covered by the Western District. Valley District towns are: Franklin County, 19; Hampshire County, 13; and Hampden County, 17, totaling 49 towns. The region is blessed with trout streams, lakes, ponds, and many scenic highways. The countryside has the rich farmland of the River Valley and the rolling hills and mountains around it. There are three trout hatcheries and one game farm located within the District.

During the fiscal year, personnel from the Connecticut Valley District were involved in a variety of activities related to research on selected species of fish and wildlife and activities aimed at fish and wildlife propagation.

In the course of maintaining and improving fisheries in the District, fisheries biologists assisted Quabbin-based research efforts with equipment and manpower; conducted a creel census to determine pressure on the trout fishery; assisted in the northern pike project at Brimfield Reservoir; assisted in the Connecticut River Shad Study by transporting alewives from Holyoke to Turners Falls; and conducted a creel census on the Connecticut River to determine pressure on the warmwater fisheries. Also, District personnel stocked streams and ponds in the Valley District with 183,050 trout and continued routine field and maintenance operations.

Wildlife biologists assisted the duck project with manpower and equipment; trapped and removed problem ducks and geese; continued work on the wood duck nesting box program; screened and obtained military surplus equipment; maintained signs, bar ways and gates on wildlife management areas; limed and fertilized the Swift River Wildlife Management Area; operated deer checking stations in Belchertown and Williamsburg; recorded and tagged pelts of furbearers; dealt with 44 complaints about nuisance beaver; stocked 10,324 pheasants and 140 hare and handled 11 complaints concerning nuisance skunks and raccoons.

Fiscal Year 1976-1977

During Fiscal 1977, personnel from the Connecticut Valley Wildlife District continued their activities in cold and warmwater fishery management, wildlife development, waterfowl and game research, assorted game-related activities and participated in a variety of public information activities.

Fisheries personnel stocked 198,000 trout in area streams and ponds; monitored water chemistry in stocked trout waters; provided District manpower and equipment for netting, stocking and other activities involved in the Quabbin study; assisted in the creel census and netting associated with the pike study and in the studies related to the Connecticut River shad and Atlantic salmon and conducted creel census on the Connecticut River.

District wildlife personnel engaged in the following activities: develope roads and grounds on wildlife management areas; assisted with manpower, equipment and materials for continued wood duck field studies; worked with experimental wood duck box light to deter starling use; trapped and removed problem ducks and geese; designed, constructed and installed duck blinds at the Ludlow controlled duck hunting area, including night work and weekends with volunteer work parties from the Western Massachusetts Duck Hunters Association who provid 69 man days of labor; continued black duck population study, operated deer checking stations; recorded and tagged furbearer pelts; stocked 12,564 pheasants and 51 hare; designed a plan and implemented farmer-cooperator use of Division property; trapped and removed or relocated problem beaver; handled nuisance animal complaints and continued routine operations and maintenance.

The District Manager and staff participated in a variety of exhibits and educational sessions. Most notable in this area is that staff from the Connecticut Valley District built, manned and maintained the Division exhibit at the Eastern States Exposition in Springfield and the Sportsmen's Show in Boston. In addition, personnel from the District played an active role in the coordination of activities for National Hunting and Fishing Day. District staffers conducted classes on wildlife activity for Holyoke Community College, 4-H groups, and taught and hosted the wildlife field trips for youngsters from the Division sponsored Massachusetts Junior Conservation Camp. The manager and his staff also helped to set up the Northeast Fish and Wildlife Conference which was held in Boston.

In activities not falling into categories already mentioned, District personnel provided assistance at the Boston office; distributed licenses, permits and stamps to town and city clerks; monitored field trials on Division property; inspected and guided field trips for the U. S. Fish and Wildlife Service to wetlands developments for environmental impact statements; authored, submitted and implemented C.E.T.A. proposals to develop Division installations and attended numerous meetings.

CENTRAL WILDLIFE DISTRICT

Carl S. Prescott
District Wildlife Manager

During fiscal years 1976 and 1977, personnel from the Central District worked on the development and maintenance of fourteen wildlife management areas. Projects undertaken and completed included: routine maintenance of one building and 124.5 miles of road (69.3 in 1976 and 55.2 in 1977); one bridge was built in 1977 and one parking lot was developed during each year; 25 signs were installed (17 in 1976, 8 in 1977) and 1,592 signs were rehabilitated or otherwise maintained (1,392 in 1976, 200 in 1977). Land development included planting of 125 trees during 1976 and seeding of herbaceous plants on 83 acres in 1976 and 39.5 acres in 1977. Timber management was carried out on 19.25 acres during 1976 and on 130 acres during 1977. A little over four acres was cleared (.5 in 1976 and 3.6 in 1977) and vegetation control measures were used on 29 acres in 1976 and 21.5 acres in 1977. Nesting structures were established and existing structures were checked and repaired where necessary requiring District personnel to work on 192 structures in 1976 and 262 in 1977. Additional manpower and time were spent on planning and project administration, custodial functions, and repair and maintenance of equipment.

The following wildlife sanctuaries were inspected and boundary signs erected or maintained in FY 1977: Watatic Wildlife Sanctuary (139 acres), Minns Wildlife Sanctuary (142 acres) and the Day Mile Tree Sanctuary (18 acres)

Furbearers were tagged at beaver check stations during FY 1976 and 1977 and consisted of 200 beaver in 1976 and 383 in 1977; 29 otters in 1977 and 14 fisher in 1977. The tagging of otter and fisher in 1976 was not mandatory. Twenty-four beaver complaints were handled in FY 1976 and 23 in FY 1977.

Timber management at Birch Hill Wildlife Management Area resulted in a harvest of 9,000 board feet in FY 1976 and 9,000 board feet in FY 1977.

Game species were stocked on management areas and in open covers by District personnel. Pheasants stocked numbered 18,912 in FY 1976 and 19,032 in FY 1977. Hare released numbered 20 in FY 1976 and 75 in FY 1977.

Wildlife personnel assisted the Fisheries Section in stocking of streams and ponds during FY 1976 and FY 1977.

Deer check stations were operated in Barre, Templeton and West Boylston during the open season in FY 1976 and 1977 and Central District staff assisted the Division of Law Enforcement on patrols during the open season on deer during these fiscal periods.

District personnel also aided researchers working on the turkey project during FY 1976 by determining the number of birds present during the winter months.

Fisheries personnel from the Central District attended four workshops related to fisheries management. They assisted in projects originating at the Westboro Field Headquarters particularly the northern pike project (F-35-R-10) at East Brimfield Reservoir. This work involved stocking sublegal pike and noting the effects on the resident fish population in East Brimfield Reservoir.

District fisheries personnel also conducted a survey of selected warm water lakes and ponds; an evaluation of cold water ponds; supplied manpower and equipment as well as service and maintenance of equipment.

A preliminary stream survey of Wekepeke Brook (Sterling-Leominster) was conducted as part of an overall evaluation of the brook as a trout stream. This was done to obtain line data needed to assess the impact of the construction of Route I-190.

Additional work completed included erecting and maintaining signs at fishing and boat launch areas; posting Division-owned or leased land; assisting the wildlife crew in pheasant stocking and working on deer check stations.

The Central District was allotted and stocked a total of 421,850 trout in selected ponds and streams of the District during the period of 1 July 1975 to 30 June 1977.

District personnel constructed or assisted in preparation of exhibits for two Boston Sportsmen's Shows and two Eastern States Exposition exhibits. In addition, the District set up and manned one exhibit for the 1975 National Hunting and Fishing Day at the Searstown Mall. The District Manager was on the 1977 Northeast Fish and Wildlife Conference committee.

One major District news release regarding year-round fishing was released in 1977. Monthly contributions were made to Massachusetts Out-Of-Doors through the reporter covering the Central District. Numerous other news contributions were made when called upon. District personnel also participated in five radio shows. Four tour-lectures were given on state lands; two to 4-H groups, one to the University of Massachusetts students and one to the Tahanto Regional High School environmental class. Nineteen speaking engagements at sportsmen's clubs were accepted, including four seminars on various Division programs.

Personnel attended 59 meetings which ranged from county leagues and sportsmen's clubs to selectmen's, conservation commissions, and Tri-County Conservation District meetings. Eighteen of these meetings concerned the construction of Route I-190 and its impact on wetlands, ponds and streams. Significant road alignment changes were made as a result of this District's direct involvement and assistance rendered to the U. S. Fish and Wildlife Service.

Eleven five-year cooperative agreements on six different management areas were developed during the past two years.

The District solicited aid from the Gardner Consortium of C.E.T.A. and secured ten participants in 1976. Six worked at the Ayer State Game Farm, four at Birch Hill. In 1977, the District assisted in securing eight participants for Ayer and eight for the Sandwich State Game Farm. In addition, the District had twelve N.Y.C. helpers in 1976 and fifteen in 1977. These people worked at the Wilbraham State Game Farm, Sandwich State Game Farm and the Westboro Beagle Area.

Through the Fish and Wildlife Service, the District screened and froze military surplus equipment. Major items obtained through the program included a D8 bulldozer, six pickup trucks, one tractor, bandsaw, disc sander, two typewriters, adding machine, light table, drafting table, power hacksaw and other shop equipment.

Preliminary meetings were held with the Nashua River Watershed Association and Nature Conservancy concerning the acquisition of 480 acres of agricultural land along the Nashua River.

Two new deer check stations were established, one on Route 2 and the other on the Massachusetts Turnpike.

In addition, District personnel undertook two winter deer census flights and spent considerable time surveying winter range conditions.

The District provided recommendations and assistance on land management to seven organizations.

NORTHEAST WILDLIFE DISTRICT

Walter L. Hoyt
District Wildlife Manager

Fiscal Year 1975-1976

Fiscal 1976 found Northeast District personnel heavily involved with both management and communication activities. During the course of the year, the manager or his designated representative attended 46 meetings: 26 county league meetings, 10 sportsmen's club meetings, and the remainder with other public and private groups. District personnel participated in the New England Sportsmen's Show, National Hunting and Fishing Day activities, the Topsfield Fair, the Essex Agricultural Fair, gatherings of the United Fly Tyers and fishing derbies sponsored by Bass Masters.

Responding to public requests, the District granted 480 camping permits, primarily to Scouts, at the Squannacook Wildlife Management Area, and participated in Acton High School's career guidance program. On a Federal level, District staff members cooperated with the U. S. Soil Conservation Service in developing "team plans" for towns, and with the U. S. Fish and Wildlife Service in executing various river basin studies. To serve the press, the District issued 45 press releases, primarily dealing with fish stocking.

In addition to these activities, District personnel continued to pursue traditional management operations. Among these were release of 7,000 pheasants and 154 white hare; conducting a woodcock census route; and assisting in natural resource inventories of designated towns and cities. During this period, District personnel posted sanctuary signs for Egg Rock, Milk Island, Carr Island, Ram Island, and Boxford, painted a house at the Bill Forward Wildlife Management Area and arranged farmer-cooperative agreements there, and conducted a Cut-a-Cord program on the Northeast Wildlife Management Area. Staffers trapped and moved 14 nuisance beavers and tagged 53 beaver pelts, maintained 400 wood duck nesting boxes and held back vegetation by applying herbicides to water chestnut growth in the Suasco drainage system.

Two special pheasant hunts were conducted in the Northeast District, a special youth hunt which drew 15 participants and the first "controlled" pheasant hunt held in the Commonwealth.

Fisheries activities involved the stocking of 220,000 trout in District ponds and streams, survey of potential trout waters, pH tests of trout waters, and maintenance and management of the Harold Parker bass system. Fisheries personnel continued their shad survey on the Merrimack River, general survey of six ponds and provided maintenance for fish ladders on the Merrimack River at Lowell and Lawrence.

Roads and signs were maintained at the Squannacook and Nissitissit Wildlife Management Areas; access and launching sites were maintained at the Delaney Wildlife Management Area, Baddacook Pond, Knops Pond, Mascopic Lake and Flint Pond. The Squannacook area itself was dedicated to the memory of Peter Bertozzi.

Fiscal Year 1976-1977

During this year, the District continued work in its traditional areas and expanded its efforts in land acquisition and public services. In the course of the year, the District Manager or his designated representatives attended 47 meetings--30 meetings of county leagues, six of sportsmen's clubs, and 11 of assorted other organizations. The District Manager issued 120 press releases of which over 100 pertained to fish stocking activities. In addition, the District was called upon by the news media on at least 50 occasions including one by a radio station. Other public contacts during this period included participation in two fishing derbies, National Hunting and Fishing Day, and five fairs or exhibits--New England Sportsmen's Show, Lowell Fly Tyers, Topsfield Agricultural Fair, Essex Agricultural Fair and Northeastern Sportsmen's Show.

The District issued 298 target permits for the Northeast Wildlife Management Area and 434 camping permits for the Northeast and other management areas. Four hundred twenty of these permits were issued to Scout or school groups. The remaining permits were issued to private individuals. Personnel from the District office participated in two high school career days and provided numerous (but untabulated) instances of wildlife services, among them nuisance animal control, weed control and pond management.

During the course of the year, there were a number of capital improvements at the District headquarters and on Division lands which were not completed during the fiscal year. The headquarters was re-roofed and painted. Considerable work was done on planning a dam for the Pantry Brook area, a road and bridge at Kent's Island and a new septic system for the headquarters.

In line with the District's traditional activities, personnel were involved with the following:

In the area of realty, District personnel initiated the purchase of 235 acres in Rowley, three tracts with a combined area of 45 acres in Newbury, and three tracts with a total of 49 acres in Pepperell.

Wildlife activities included the distribution of 6,456 pheasants and 12 white hare. The controlled pheasant hunt on the Delaney Wildlife Management Area, initiated in 1975-1976, was continued. As in the previous year, District personnel conducted a woodcock census and continued to assist the U. S. Soil Conservation Service in its inventory of natural resources of selected towns and cities. District personnel also dealt with furbearers, tagging pelts of beaver, otter and fisher in addition to live trapping and moving ten nuisance beaver.

As part of their fisheries activities, District staffers tested designated trout streams and ponds for acidity and surveyed an additional 30 ponds under consideration for future stocking. Special surveys were inaugurated at the Burlington reservoir and at the upper and lower reservoirs in Saugus. Trout were stocked as in previous years and a general resurvey of trout waters was begun.

SOUTHEAST WILDLIFE DISTRICT

Louis Hambly
District Wildlife Manager

Fiscal Year 1975-1976

During 1975-1976, the staff of the Southeast Wildlife District continued traditional management and habitat improvement programs and gathered data for a variety of research projects. Included among the District's fishery activities were: conducting an analysis of water chemistry in selected trout ponds to determine their potential for supporting trout populations; performing periodic pH checks on ponds and streams within the district; reclamation of Higgins Pond in Brewster and Hathaway Pond in Barnstable. This was coordinated with construction and installation of egg trays and floating hatch racks aimed at establishing a viable smelt population in the two ponds. In connection with the reclamation, District personnel undertook a program of biological sampling and creel census of fishermen at Higgins and Hathaway. In addition, Southeast District personnel assisted biologists from the Westboro office in their investigations of Great Herring Pond. They participated in a general survey of the pond, carried out a creel census and built and installed artificial reefs made from discarded tires. During this period, the District initiated a survey of fish species in the Taunton River Drainage System--a project which continued through the end of 1976.

Maintenance efforts were concentrated on the Rochester rearing system, public access sites and on signs throughout the district.

Wildlife activities carried on within the district included the following: preparation and planting of 25 acres of annual grains and 38 acres of herbaceous cover; planting of trees and shrubs at three wildlife management areas; top dressing of 41 acres of perennial herbaceous cover, cutting and limiting trees and brush where needed. Areas so treated include 21 acres cut and 57 acres treated with herbicides at the Freetown Wildlife Management Area; 79 acres cut over at the Crane Wildlife Management Area. Roads, trails, gates and fences required maintenance at four wildlife management areas and parking areas were maintained at three. In addition, District personnel constructed and erected signs for six management areas, conducted hunter checks at three areas and continued maintenance on two buildings on the Crane area. The Crane area was set up for field trials, group camping and horse shows. Planning efforts were concentrated at West Meadows Wildlife Management Area where the dam was adjusted and projects were planned and laid out for incoming Y.C.C. workers, and at Freetown Wildlife Management Area where a wildlife management plan was devised.

District personnel also participated in wildlife research projects capturing and banding 551 black ducks and mallards wintering along the coastline as well as banding other waterfowl and doves and maintaining and checking wood duck nesting boxes.

During this period, personnel in the area stocked 12,015 pheasants, 3,100 quail and 68 hare.

In addition to these activities, the staff operated two biological and ten regular deer checking stations, investigated five beaver complaints, conducted two woodcock census routes and 12 quail census routes, and investigated three deer damage complaints. They assisted in land acquisition and assisted landowners in dealing with bird and mammal problems, provided technical assistance to sportsmen's groups, Conservation Commissions, planning groups and other organizations and individuals. The staff provided programs for school, Scout and other non-professional groups and participated, often as host, in 43 meetings.

Fiscal Year 1976-1977

Most of the activities carried out during this fiscal year were continuations of projects undertaken during 1975-1976. Fisheries activities included continuation of water chemistry checks on trout ponds and pH checks on stocked waters, collection and stocking of smelt eggs in Higgins and Hathaway Ponds and modification of the hatching racks in those ponds. Once again, biological survey and creel census were conducted on these ponds as well as Great Herring Pond; access sites and signs were maintained and the water control structure at the Rochester rearing system was rebuilt. Smallmouth bass were salvaged from Watuppa Pond and stocked into Peters Pond in Sandwich and Ashumet Pond in Falmouth.

Wildlife activities on the management areas included preparation and planting of 5.5 acres of winter rye, 4 acres of herbaceous cover and a variety of shrubs and trees. Twenty-six acres of fields were mowed to control growth, 26 acres at Crane Wildlife Management Area were cut, and herbicide was applied on 23 acres at the Freetown Wildlife Management Area. Roads, trails, parking lots, gates and fences were maintained and signs were constructed and erected at six areas. District personnel continued the program of hunter checks and continued to improve facilities at the Crane area by pouring a concrete floor and installing electricity in the storage building. As in the previous year, the Crane area was prepared for special interest groups including campers, field trial groups and horse show participants. Management plans were developed for the Rocky Gutter Wildlife Management Area and projects were laid out for Y.C.C. workers at West Meadows.

Personnel continued their involvement in research projects capturing and banding 1,674 black ducks and mallards wintering along the coastline, constructing and checking wood duck nesting boxes, banding doves and running three woodcock census routes.

Stocking for the district included release of 12,161 pheasants (11,318 cocks and 843 hens), 2,880 quail and 30 white hare.

In addition, the staff continued to operate two biological and eleven regular deer checking stations. Two beaver complaints were investigated and box traps and advice were provided individuals reporting problems with other mammals or birds. Division personnel provided technical assistance to sportsmen's clubs, Conservation Commissions and a variety of other organizations, participated in fish stocking and salvage, continued routine maintenance of equipment and participated in a total of 47 meetings.

LEGISLATION ENACTED DURING FISCAL YEAR 1976

Chapter 498, Acts of 1975: An act relative to the appraisal of damages caused by deer. Approved 15 July 1975.

Chapter 499, Acts of 1975: An act authorizing the Division of Fisheries and Game to grant certain easements to the Town of Falmouth. Approved 15 July 1975.

Chapter 706, Acts of 1975: An act relative to the Executive Office of Environmental Affairs. Approved 25 November 1975.

Chapter 811, Acts of 1975: An act authorizing the Director of Fisheries and Wildlife to grant to the Town of Spencer an easement for purposes of water standpipe and water line installations. Approved 22 December 1975.

Chapter 115, Acts of 1976: An act providing for the reimbursement of certain farmers for damage caused by deer or moose. Approved 20 May 1976.

Chapter 178, Acts of 1976: An act allowing certain non-residents of the Commonwealth to be issued complimentary hunting and fishing licenses. Approved 18 June 1976.

Chapter 8, Resolves of 1976: Providing for an investigation and study by the Secretary of Environmental Affairs relative to the feasibility of allowing fishing through the ice, under a controlled program, at the Wachusett Reservoir. Approved 1 June 1976.

LEGISLATION ENACTED DURING FISCAL YEAR 1977

Chapter 381, Acts of 1976: An act relative to the payment of fees for antlerless deer permits. Approved 4 October 1976.

PERSONNEL

Personnel changes during 1976 and 1977 include:

Retirements

Lawrence Bonney, Assistant Game Culturist, retired 1 August 1975 after 27 years of service.

James M. Shepard, Director, retired 31 August 1975 after 25 years of service.

Madeline Ellis, Senior Clerk, retired 30 September 1975, after 28 years of service.

Stanley Jajuga, Skilled Conservation Helper, retired 28 July 1976 after 25 years of service.

Colton H. Bridges, Director, retired 13 November 1976 after 21 years of service.

Eleanor Kane, Senior Clerk, retired 7 March 1977 after 28 years of service.

Others who left Division employment include:

Jordan Bourgault, October 1975
Ann Frances Cogavin, July 1975
Ronald J. Kazlauskas, January 1976
Mark C. Smith, April 1976
Allan Thompson, January 1976
Hilda Bevis, October 1976
George Boudreau, October 1976
Patricia Filleti, September 1976
Benjamin Hogdon, August 1976
Susan McNeil, July 1976
Kenneth Norcross, June 1977
Thomas O'Connor, September 1976
Frank Zoly, July 1976
Arthur Neill, October 1976
Allan Falls, July 1976
Edward F. Williams, January 1976

Joining the Division were:

Matthew B. Connolly, Jr., Director, December 1976
Michael Brazauskas, Conservation Helper, May 1976
John Clancy, Journalist, April 1976
Richard Keller, Conservation Helper, May 1976
Earl LaBonte, Conservation Helper, May 1976
Marcia Walker, Conservation Helper, May 1976
Raymond Wheeler, Skilled Conservation Helper, May 1976
Gary Galas, Conservation Helper April 1977
Philip Breen, Conservation Helper, August 1976
Arthur Duffy, Senior Clerk, August 1976

Diane Ferragamo, Junior Clerk, July 1976
Michael Fillion, Conservation Helper, August 1976
Linda Sacco, Junior Clerk, September 1976
Martin Wrubel, Conservation Helper, August 1976
Elizabeth Sienczyk, Senior Clerk, December 1976
Louis Hambly, Jr., District Manager, January 1977
John Hendee, Jr., Fish Culturist, January 1977
Ellie Horwitz, Information-Education Chief, May 1977
Arthur Leonard, Conservation Helper, May 1977

COMMONWEALTH OF MASSACHUSETTS
DIVISION OF FISHERIES AND WILDLIFE

General Administration

"How the Sportsman's Dollar was Spent" - FY 1976

	Account #		Expenditure	% of Budget
ADMINISTRATION				
Administration	2310-0200	$274,319.53		
Board of Fisheries & Wildlife	2310-0200	$ 50.00	$274,369.53	7.54%
Information-Education	2310-0200		$153,264.60	4.22%
FISHERIES PROGRAMS				
Fish Hatcheries	2310-0600		$547,074.28	15.05%
**Fisheries Management	2310-0600	$373,838.54		
Fisheries Cooperative Unit	2310-0600	$ 12,000.00		
**Wildlife Management	2310-0400	$192,554.37	$578,392.71	15.91%
WILDLIFE MANAGEMENT				
Game Farms	2310-0400		$379,439.34	10.44%
**Wildlife Management	2310-0400	$192,554.38		
Wildlife Cooperative Unit	2310-0400	$ 11,000.00		
Damage by Wild Deer & Moose	2310-0800	$ 13,075.89	$216,630.26	5.96%
LAND ACQUISITION				
**Coastal and Inland Waters Acquisitions	2670-9016		$443,045.88	12.19%
ENGINEERING AND CONSTRUCTION				
*Renovation of Lyman School	2670-8753	$ 21,917.28		
*Pollution Abatement	2670-9021	$ 4,698.39		
*Fish Screens	2670-9022	$ 7,065.94		
*Fish Rearing Facilities	2670-9023		$ 33,682.61	.93%

"How the Sportsman's Dollar was Spent" - FY 1976 (Continued)

SECRETARY, ENVIRONMENTAL AFFAIRS			
Office of Secretary (3%)	2000-0100	$ 3,473.93	.10%
Review of Environmental Impact Studies (3%)	2000-0200	$ 2,900.96	.08%
DEPARTMENT OF FISHERIES, WILDLIFE & RECREATIONAL VEHICLES			
Commissioner's Office (50%)	2300-0100	$ 15,530.20	.43%
DIVISION OF LAW ENFORCEMENT			
Natural Resource Officers Salaries and Expenses (30%)	2020-0100	$ 339,436.11	9.34%
Hunter Safety Training (100%)	2020-0300	$ 33,479.31	.92%
RETIREMENT ASSESSMENT (.2%)	0612-1000	$ 153,570.92	4.23%
GROUP INSURANCE	1590-1007	$ 109,232.96	3.01%
INTEREST ON BONDED DEBT (100%)	0699-2800	$ 78,025.00	2.15%
MATURING SERIAL BONDS & NOTES (100%)	0699-2900	$ 270,000.00	7.43%
TRANSFERS FROM FUND		$ 2,220.07	.06%
CERTAIN CLAIMS	1590-1006	$ 500.00	.01%
		$3,634,269.13	100.00%

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* Continuing Appropriation
** Portions of expenditures 60% or 75% reimbursable by Federal Government
*** Certain Land Acquisitions are 50% reimbursable by Federal Government

COMMONWEALTH OF MASSACHUSETTS
DIVISION OF FISHERIES AND WILDLIFE

Appropriations and Expenditures

Fiscal Year July 1, 1975 to June 30, 1976

Account No.	Title	Appropriation	Expenditures and Liabilities	Total Reversion
2310-0200	Administration	$ 472,252.00	$ 427,634.13	$ 44,617.87
2310-0400*	Wildlife Management	$ 793,826.00	$ 775,543.59	$ 18,277.41
2310-0600*	Fisheries Management	$ 965,527.00	$ 932,912.62	$ 32,614.38
2310-0800	Damage by Wild Deer and Moose	$ 14,306.92	$ 13,075.89	$ 1,231.03
		$2,245,911.92	$2,149,171.23	$ 96,740.69

		Continuing Appropriations	Expenditures	Balance Forward
2670-8753	Renovation of Lyman School	$ 23,333.14	$ 21,917.28	$ 1,415.86
2670-9016**	Land Acquisition: Coastal & Inland Wetlands	$3,322,408.30	$ 443,045.88	$2,879,362.42
2670-9021	Pollution Abatement: McLaughlin Hatchery	$ 81,058.97	$ 4,698.39	$ 76,360.58
2670-9022	Fish Screens: Quabbin Reservoir	$ 11,172.31	$ 7,066.94	$ 4,105.37
2670-9023	Fish Rearing Facilities: McLaughlin & Palmer Hatcheries	$ 441.19		$ 441.19
		$3,438,413.91	$ 476,728.49	$2,961,685.42

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* Portions of expenditures 60% or 75% reimbursable by Federal Government

** Certain Land Acquisitions are 50% reimbursable by Federal Government

SUMMARY OF FISH AND WILDLIFE INCOME

July 1, 1975 to June 30, 1976

Fishing, Hunting and Trapping Licenses	3304-61-01-40	$2,568,416.25*
Trap Registrations	3304-61-01-40	$ 978.50*
Archery Stamps	3304-61-01-40	$ 37,012.40*
Special Licenses, Tags and Posters		$ 10,221.75**
Waterfowl Stamps	3304-40-01-40	$ 5,978.50*
Waterfowl Stamps - Ducks Unlimited	3304-40-02-40	$ 22,444.00
Antlerless Deer Permits	3304-61-14-40	$ 15,690.60
Bear Permits	3304-61-14-40	$ 240.00
Rents	3304-63-01-40	$ 8,272.25
Miscellaneous Income	3304-69-99-40	$ 725.91
Sales, Other	3304-64-01-40	$ 5,058.75
Refunds Prior Year	3304-69-01-40	$ 1,300.43
Court Fines and Penalties	3308-41-01-40	$ 10,293.00
Pittman-Robertson Federal Aid	3304-67-01-40	$ 214,332.76
Dingell-Johnson Federal Aid	3304-67-02-40	$ 203,647.75
Anadromous Fish Projects Federal Aid	3304-67-04-40	$ 43,474.22
Mass. Mourning Dove & Woodcock Reimbursement	3304-67-05-40	
Indirect Cost Reimbursement	3304-67-67-40	$ 90,007.12
Acquisition Projects Reimbursement	3304-67-10-40	$ 104,330.6
Water Pollution Control Reimbursement of Services	3304-62-01-40	$ 38,428.59
Interest on Investments	3395-60-01-40	$ 28,877.84
		$3,414,731.42

*See Detail Sheet No. 1
**See Detail Sheet No. 2

OTHER INCOME-INLAND FISHERIES AND GAME FUND

Gasoline Tax Apportionment:	$ 294,774.60
Surplus in Inland Fish and Game Fund as of June 30, 1976	$1,788,299.07

DIVISION OF FISHERIES AND WILDLIFE

Receipts from Fishing, Hunting and Trapping Licenses

Fiscal Year 1 July 1975 to 30 June 1976

License	Price	Quantity	Gross Amount	Fees Retained by Clerks	Net Returned to State
Series #1 Res. Cit. Fishing	8.25	141,804	$1,169,825.25	$ 35,215.25	$1,134,610.00
Series #2 Res. Cit. Hunting	8.25	58,228	480,383.00	14,455.50	465,927.50
Series #3 Res. Cit. Sporting	13.50	54,727	738,819.75	13,574.25	725,245.50
Series #4 Res. Cit. Minor Fishing	6.25	15,112	94,450.00	3,769.50	90,680.50
Series #5 Res. Cit. Alien Fishing	11.25	1,037	11,666.25	249.25	11,417.00
Series #6 Non-Res. Alien Fishing & Non-Res. Cit. Fishing	14.25	3,037	43,283.25	749.00	42,534.25
Series #7 Non-Res. Alien 7-da. Fishing & Non-Res. Cit.	8.25	1,856	15,312.00	460.00	14,852.00
Series #8 Non-Res. Alien Hunting (Small Game) & Non-Res. Cit.	20.25	828	16,767.00	198.75	16,568.25
Series #9 Non-Res. Alien Hunting (C.S.P. 3 da. Small Game) & Non-Res. Cit.	16.25	30	487.50	7.50	480.00
Series #10 Res. Cit. Minor Trapping	6.25	443	2,768.75	110.00	2,658.75
Series #11 Res. Cit. Trapping	11.50	872	10,028.00	214.75	9,813.25
Series #12 Duplicates	1.00	3,629	3,629.00		3,629.00
Series #13 Res. Alien Hunting	16.25	1,254	20,377.50	7.25	20,370.25
Series #14 Non-Res. Alien Hunting (Big Game) & Non-Res. Cit.	35.25	846	29,840.50	210.50	29,630.00
Series #15 Res. Cit. Sporting (over 70)	Free	19,115			
Series #16 Res. Cit. Fishing for Blind, Paraplegic & Mentally Retarded	Free	1,171			
Series #17 Res. Cit. Hunting for Paraplegic	Free	74			
		304,063	$2,637,637.75	$ 69,221.50	$2,568,416.25
Series #18 Archery Stamps	5.10	7,402	37,750.20	737.80	37,012.40
		311,465	$2,675,387.95	$ 69,959.30	$2,605,428.65
Series #19 Waterfowl Stamps	1.25	27,961	35,068.75	6,646.25	28,422.50
		339,426	$2,710,456.70	$ 76,605.55	2,633,851.15

SPECIAL LICENSES, TAGS AND POSTERS

Fiscal Year July 1, 1975 to June 30, 1976

Receipt Acct.	Type of License	Quantity & Unit Price	Amoun
3304-61-02-40	Fur Buyers		
	Resident Citizen	24 @ 15.00	360.00
	Non-Resident or Alien	6 @ 50.00	300.00
3304-61-03-40	Taxidermists	114 @ 10.00	1,140.00
3304-61-04-40	Propagators		
	Special Purpose Permits	121 @ 1.00	121.00
	Class 1 (fish)		
	Initial	13 @ 7.50	97.50
	Renewal	147 @ 5.00	735.00
	Class 3 (Fish)		
	Initial	3 @ 7.50	22.50
	Renewal	70 @ 5.00	350.00
	Class 4 (Birds & Mammals)		
	Initial	132 @ 7.50	990.00
	Renewal	415 @ 5.00	2,075.00
	Class 6 (Dealers)		
	Initial	4 @ 7.50	30.00
	Renewal	51 @ 5.00	255.00
	Additional	274 @ 1.50	411.00
	Class 7 (Individual Bird or Mammal)		
	Initial	21 @ 3.00	63.00
	Renewal	48 @ 1.00	48.00
	Importation Permits	62 @ 5.00	310.00
	Class 9		
	Falconry (Master)	2 @ 25.00	50.00
	Falconry (Apprentice)	11 @ 25.00	275.00
	Class 10 (Raptor Breeding & Salvage)	2 @ 25.00	50.00
	Take Shiners*	19 @ 5.00	95.00*
3304-61-05-40	Take Shiners	121 @ 5.00	605.00
3304-61-06-40	Field Trial Licenses	4 @ 15.00	60.00
3304-61-07-40	Taking of Carps & Suckers for Sale		
3304-61-08-40	Quail for Training Dogs		
	Initial	15 @ 7.50	112.50
	Renewal	36 @ 5.00	180.00
3304-61-10-40	Commercial Shooting Preserves	10 @ 50.00	500.00
3304-61-11-40	Trapping of Certain Birds		
3304-61-12-40	Mounting Permits	7 @ 2.00	14.00
3304-61-13-40	Special Field Trial Permits	39 @ 15.00	585.00
3304-64-01-40	Game Tags	4,945 @ .05	247.25
	Fish Tags	7,400 @ .01	74.00
	Commercial Shooting Preserve tags & posters	1,320 @ .05	66.00
			10,221.75
3304-61-01-40	Trap Registrations		
	Initial	204 @ 2.00	408.00
	Renewal	375 @ 1.50	562.50
	Duplicates	8 @ 1.00	8.00
			973.50

*Inadvertently these licenses were deposited under Propagators' Receipt Account (#3304-61-04-40); should have been deposited under Licenses to Take Shiners' Receipt Account (#3304-61-05-40).

COMMONWEALTH OF MASSACHUSETTS
DIVISION OF FISHERIES AND WILDLIFE

General Administration

"How the Sportsman's Dollar was Spent" - FY 1977

	Account #		Expenditure	% of Budget
ADMINISTRATION				
Administration	2310-0200	$ 298,404.94		
Board of Fisheries and Wildlife	2310-0200		$ 298,404.94	4.86%
Information-Education	2310-0200		$ 165,613.83	2.70%
FISHERIES PROGRAM				
Fish Hatcheries	2310-0600		$ 613,549.22	9.98%
**Fisheries Management	2310-0600	$ 435,136.87		
Fisheries Cooperative Unit	2310-0600	$ 15,000.00		
**Wildlife Management	2310-0400	$ 220,549.56	$ 670,686.43	10.91%
WILDLIFE PROGRAM				
Game Farms	2310-0400		$ 462,237.50	7.52%
**Wildlife Management	2310-0400	$ 220,549.57		
Wildlife Cooperative Unit	2310-0400	$ 15,000.00		
Damage by Wild Deer and Moose	2310-0800	$ 12,725.47	$ 248,275.04	4.04%
LAND ACQUISITION				
***Acquisition of Upland Areas and Inholding on Existing Areas	2310-0310	$ 420,267.00		
***Coastal and Inland Waters Acquisition	2670-9016	$2,154,529.06	$2,574,796.06	41.90%
SECRETARY, ENVIRONMENTAL AFFAIRS				
Office of the Secretary (3%)	2000-0100		$ 4,094.64	.07%
Review of Environmental Impact Studies (3%)	2000-0200		$ 3,976.12	.06%

"How the Sportsman's Dollar was Spent" - FY 1977 (Continued)

ENGINEERING AND CONSTRUCTION				
*Development and Improvement of Facilities for Public Use	2310-0300	$ 50,954.13		
*Renovation of Lyman School	2670-8753	$ 1,379.47		
*Pollution Abatement (McLaughlin)	2670-9021	$ 10,255.93		
*Fish Screens (Quabbin Reservoir)	2670-9022			
*Fish Rearing Facilities (Palmer and McLaughlin)	2670-9023	$ 436.68	$ 63,026.21	1.03%
DEPARTMENT OF FISHERIES, WILDLIFE AND RECREATIONAL VEHICLES				
Commissioner's Office (50%)	2310-0100		$ 30,116.61	.49%
DIVISION OF LAW ENFORCEMENT				
Natural Resource Officers' Salaries and Expenses (30%)	2020-0100		$ 360,240.98	5.87%
Hunter Safety Training (100%)	2020-0300		$ 51,823.51	.84%
TRANSFERS FROM FUND				
Group Insurance	1590-1007		$ 14,976.10	.24%
Salary Adjustments			$ 50,393.00	.82%
Small Deficiencies and Claims			$ 1,630.90	.02%
RETIREMENT ASSESSMENT (.2%)	0612-1000		$ 173,914.58	2.83%
INTEREST ON BONDED DEBT	0699-2800		$ 78,655.00	1.28%
MATURING SERIAL BONDS AND NOTES	0699-2900		$ 270,000.00	4.39%
CERTAIN CLAIM	2310-1201		$ 9,050.00	.15%
			$6,145,460.67	100.00%

*Continuing Appropriation
**Portions of expenditures 60% or 75% reimbursable by Federal Government.
***Certain land acquisitions are 50% reimbursable by Federal Government.

COMMONWEALTH OF MASSACHUSETTS
DIVISION OF FISHERIES AND WILDLIFE

Appropriations and Expenditures
Fiscal Year 1 July 1976 to 30 June 1977

Account No.	Title	Appropriation	Expenditures and Liabilities	Total Reversion
2310-0200	Administration	$ 514,933.00	$ 464,018.77	$ 50,914.23
2310-0400*	Wildlife Management	$ 932,181.00	$ 918,336.63	$ 13,844.37
2310-0600*	Fisheries Management	$1,067,173.00	$1,063,686.09	$ 3,436.91
2310-0800	Damage by Wild Deer and Moose	$ 12,755.00	$ 12,725.47	$ 29,53
		$2,527,042.00	$2,458,766.96	$ 68,275.04

		Continuing Appropriations	Expenditures	Balance Forward
2310-0300	Development and Improvement Facilities for Public Use	$ 500,000.00	$ 50,954.13	$ 449,045.87
2310-0310**	Acquisition of Upland Areas and Inholding on Existing Areas	$ 500,000.00	$ 420,267.00	$ 79,733.00
2670-8753	Certain Renovations to Lyman School Building	$ 1,415.86	$ 1,379.47	$ 36.39
2670-9016**	Acquisition of Coastal and Inland Wetlands	$2,879,362.42	$2,154,529.06	$ 724,833.36
2670-9021	Pollution Abatement: McLaughlin Hatchery	$ 76,360.58	$ 10,255.93	$ 66,104.65
2670-9022	Fish Screens: Quabbin Reservoir	$ 4,105.37		$ 4,105.37
2670-9023	Fish Rearing Facilities: Palmer and McLaughlin Hatcheries	$ 441.19	$ 436.68	$ 4.51
		$3,961,685.42	$2,637,822.27	$1,323,863.15

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*Portions of expenditures 60% or 75% reimbursable by Federal Government.
**Certain land acquisitions are 50% reimbursable by the Federal Government.

SUMMARY OF FISH AND WILDLIFE INCOME

1 July 1976 to 30 June 1977

Fishing, Hunting and Trapping Licenses*	3304-61-01-40	$2,336,222.00
Trap Registrations**	3304-61-01-40	$ 956.00
Archery Stamps*	3304-61-01-40	$ 36,315.60
Special Licenses, Tags and Posters**		$ 9,952.75
Waterfowl Stamps*	3304-40-01-40	$ 5,531.75
Waterfowl Stamps - Ducks Unlimited*	3304-40-02-40	$ 20,108.00
Antlerless Deer Permits	3304-61-14-40	$ 15,023.78
Bear Permits	3304-61-14-40	$ 239.50
Rents	3304-63-01-40	$ 11,598.00
Miscellaneous Income	3304-69-99-40	$ 1,088.32
Sales, Other	3304-64-01-40	$ 16,895.25
Refunds Prior Year	3304-69-01-40	$ 34.14
Court Fines and Penalties	3304-41-01-40	$ 200.00
Court Fines and Penalties	3308-41-01-40	$ 14,971.00
Pittman-Robertson Federal Aid	3304-67-01-40	$ 232,982.05
Dingell-Johnson Federal Aid	3304-67-02-40	$ 101,877.60
Anadromous Fish Projects Federal Aid	3304-67-04-40	$ 1,426.85
Indirect Cost Reimbursement	3304-67-67-40	$ 41,246.94
Water Pollution Control - Reimbursement for Services	3304-62-01-40	$ 43,004.05
Interest on Investments	3395-60-01-40	$ 54,789.57
Gasoline Tax Apportionment	3312-05-01-40	$ 305,339.21
		$3,249,802.36

Surplus in Inland Fish and Game Fund as of 30 June 1977 $ 694,000.00

*Detail Sheet No. 1
**Detail Sheet No. 2

DIVISION OF FISHERIES AND WILDLIFE

Receipts from Fishing, Hunting and Trapping Licenses
Fiscal Year 1 July 1976 to 30 June 1977

Series	Type of License	Price	Quantity	Gross Amount	Fees Retained by Clerks	Net Returned to State
1	Res. Cit. Fishing	8.25	128,608	$1,061,015.30	$ 31,970.75	$1,029,044.55
2	Res. Cit. Hunting	8.25	52,189	$ 430,559.25	$ 12,953.75	$ 417,605.50
3	Res. Cit. Sporting	13.50	51,238	$ 691,713.00	$ 12,714.00	$ 678,999.00
4	Res. Cit. Minor Fishing	6.25	10,979	$ 68,618.75	$ 2,739.50	$ 65,879.25
5	Res. Cit. Alien Fishing	11.25	1,011	$ 11,373.75	$ 247.25	$ 11,126.50
6	Non-Res. Alien and Cit. Fishing	14.25	2,893	$ 41,225.25	$ 716.00	$ 40,509.25
7	Non-Res. Alien and Cit. 7-day Fishing	8.25	1,888	$ 15,576.00	$ 468.25	$ 15,107.75
8	Non-Res. Alien and Cit. Small Game Hunting	20.25	783	$ 15,855.75	$ 188.00	$ 15,667.75
9	Non-Res. Alien and Cit. C.S.P. 3 day Small Game Hunting	16.25	28	$ 455.00	$ 6.75	$ 448.25
10	Res. Cit. Minor Trapping	6.25	446	$ 2,787.50	$ 111.00	$ 2,676.50
11	Res. Cit. Trapping	11.50	913	$ 10,499.50	$ 225.00	$ 10,274.50
12	Duplicates	1.00	3,614	$ 3,614.00		$ 3,614.00
13	Res. Alien Hunting	16.25	1,092	$ 17,745.00	$ 6.50	$ 17,738.50
14	Non-Res. Alien and Cit. Big Game Hunting	35.25	795	$ 28,023.75	$ 197.50	$ 27,826.25
15	Res. Cit. Sporting (over 70)	Free	19,007			
16	Res. Cit. Fishing for Blind, Paraplegic and Mentally Retarded	Free	1,259			
17	Res. Cit. Hunting for Paraplegics	Free	65			
			276,808	$2,399,061.30	$ 62,544.25	$2,336,517.55
18	Archery Stamps	5.10	7,262	$ 37,036.70	$ 721.10	$ 36,315.60
			284,070	$2,436,098.50	$ 63,265.35	$2,372,833.15
19	Waterfowl Stamps	1.25	25,135	$ 31,418.75	$ 5,779.00	$ 25,639.75
			309,205	$2,467,517.25	$ 69,044.35	$2,398,472.90
			Less Bad Checks and Refunds			$ 295.55
						$2,398,177.35

SPECIAL LICENSES, TAGS AND POSTERS
Fiscal Year 1976-1977

Receipt Acct.	Type of License	Quantity and Unit Price	Amount
3304-61-02-40	Fur Buyers		
	Resident Citizens	22 @ 15.00	$ 330.00
	Non-Resident or Alien	7 @ 50.00	$ 350.00
3304-61-03-40	Taxidermist	119 @ 10.00	$ 1,190.00
3304-61-04-40	Propagators		
	Special Purpose Permits	121 @ 1.00	$ 121.00
	Class 1 (Fish)		
	Initial	13 @ 7.50	$ 97.50
	Renewal	147 @ 5.00	$ 735.00
	Class 3 (Fish)		
	Initial	3 @ 7.50	$ 22.50
	Renewal	70 @ 5.00	$ 350.00
	Class 4 (Birds and Mammals)		
	Initial	134 @ 7.50	$ 1,005.00
	Renewal	371 @ 5.00	$ 1,855.00
	Class 6 (Dealers)		
	Initial	4 @ 7.50	$ 30.00
	Renewal	51 @ 5.00	$ 255.00
	Additional	274 @ 1.50	$ 411.00
	Class 7 (Individual Bird or Animal)		
	Initial	21 @ 3.00	$ 63.00
	Renewal	47 @ 1.00	$ 47.00
	Importation Permit	62 @ 5.00	$ 310.00
	Class 9		
	Falconry (Masters)	2 @ 25.00	$ 50.00
	Falconry (Apprentice)	11 @ 25.00	$ 275.00
	Class 10 (Raptor Breeding and Salvage)	2 @ 25.00	$ 50.00
3304-61-05-40	Take Shiners	135 @ 5.00	$ 675.00
	Duplicates	1 @ 1.00	$ 1.00
3304-61-06-40	Field Trial Licenses	5 @ 15.00	$ 75.00
3304-61-08-40	Quail for Training Dogs		
	Initial	10 @ 7.50	$ 75.00
	Renewal	36 @ 5.00	$ 180.00
3304-61-10-40	Commercial Shooting Preserve	9 @ 50.00	$ 450.00
3304-61-12-40	Mounting Permit	7 @ 2.00	$ 14.00
3304-61-13-40	Special Field Trial Permit	34 @ 15.00	$ 510.00
3304-64-01-40	Tags and Posters		
	Game Tags	5,375 @ .05	$ 268.75
	Fish Tags	9,100 @ .01	$ 91.00
	Commercial Shooting Preserve Tags and Posters	1,320 @ .05	$ 66.00
3304-61-01-40	Trap Registrations		
	Initial	202 @ 2.00	$ 404.00
	Renewal	368 @ 1.50	$ 552.00
			$10,908.75

MASSACHUSETTS DIVISION OF FISHERIES AND WILDLIFE

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Approved by Alfred C. Holland, State Purchasing Agent.

THE BOARD REPORTS

Bradlee C. Gage, Chairman
Kenneth Burns, Secretary
Martin Burns
Donald Coughlin
George Darey
James Baird
Philip Stanton

As required by law, the Administrative Board of the Division of Fisheries and Wildlife met monthly throughout the year, except during February. That meeting was cancelled because of the blizzard. Fiscal 78 marked the first full year of administration by the Division's new director, Matthew B. Connolly, Jr. Division morale is high and, in the Board's opinion, the Division is filling its role as the manager of the Commonwealth's fisheries and wildlife resources in an exemplary manner.

New Board Members

There were two changes in Board personnel during Fiscal 78. George Darey from Berkshire County and Don Coughlin from Barnstable County replaced Henry Russell and Roger Williams as appointees on the Board. Both Henry Russell and Roger Williams have served the Commonwealth and the sportsmen well and will be missed. However, the new members are ably qualified and are welcome additions. It is particularly gratifying once again to have a Board member from Berkshire County which is a key hunting and fishing area.

Board Concerns

Besides its usual review of Division activities and hearings, the Board devoted some time to three specific areas: (1) concern with current salary levels of its professional staff in comparison to Federal and neighboring state salary levels; (2) concern over the status of Division equipment; and (3) non-game management.

While the Board recognizes its limitations as far as being able to increase salary levels within the Division, it is concerned that current salary levels are falling behind. While money is not always the key or deciding factor in keeping professionals within the Division, it is an important factor. The Board has always taken a great deal of satisfaction in the high qualifications and professionalism of the technicians within the Division and is distressed when salary levels are not competitive with similar Federal positions or with neighboring states.

The Board certainly recognizes the fiscal restraints necessary within the state, yet it is very concerned with the deteriorating quality of Division equipment--from cars to chain saws to boats. To do its job adequately, the Division needs good working equipment and the Board supports fully the efforts of the Director to include new equipment as a priority budget item.

The Board is concerned over the long run as to how the Division will be involved in non-game management work. Over the past several decades, by legislative action, the Division has been deeply involved with many areas of non-game management--work it has done willingly and well. However, as the concern in non-game management increases, particularly at the Federal level, it appears that the Division will become more formally involved. The Board feels Division involvement in non-game management should become a legitimate Division function rather than being done outside the Division by Federal efforts or by another state agency. The Board, however, recognizes differences in philosophies and the practical aspects which complicate development of legislation acceptable to all parties.

Hearings

The Board conducted several hearings on proposed regulatory changes during Fiscal 78. In waterfowl hearings, the split season concept was continued and a season similar to that of the previous year was adopted. The Board recognizes that an ideal compromise between the coastal gunner and the inland waterfowl hunter is still not possible under current Federal guidelines.

In dealing with squirrel regulations, the Board established a new concept in statewide regulations, looking at the state from the point of view of zones, recognizing that the urban eastern part of the state might well require different regulations than the rural western section.

Division Activities

In its role as "overseer" of Division activities the Board, in conjunction with the Director and his staff, monitored aspects of Division work at its monthly board meetings. Besides considering normal Division activities, the Board followed up its monitoring of monies spent in Canada on projects funded by the Massachusetts waterfowl stamp, explored long-range planning as to possible changes in the MASSACHUSETTS WILDLIFE publication, kept abreast of the anadromous fish restoration efforts in the Merrimack and Connecticut Rivers, explored the CETA and YACC programs starting in the Division, and followed closely the Northeast Regional Firearms Educational Marksmanship Center at Otis Air Force Base on Cape Cod.

Land Acquisition

A strong program of land acquisition continued, backed enthusiastically by the sportsmen, the Director and his staff, and the Board. The Board continued to meet on almost a monthly basis with Floyd Richardson, Chief of Wildlife Lands, to review land acquisition efforts and to formally move to expend Division monies for specific tracts of land.

While the Board remains committed to land acquisition, it recognizes that dwindling funds in the future may force cutbacks from the present level of expenditures. However, the Board's objective remains to ensure that the equivalent of one dollar per license is earmarked for land investment.

In summary, the Division continues its strong position, fulfilling its role as manager of the Commonwealth's fisheries and wildlife resources. The Board appreciates the continued efforts of the sportsmen, the legislature, and other state agencies in its efforts to move ahead.

PLANNING

Paul S. Mugford
Senior Land Use Planner

The Division's commitment to a full-fledged and continuous planning effort, initiated in 1975 with the appointment of a planner to the staff, was intensified by the addition, in August 1977, of two more planners. The appointments of the two assistant planners, John J. Jonasch and Thomas J. Early, created a three-man team and led to the institution of the first fully comprehensive agency planning program. Experienced planning specialists from the United States Fish and Wildlife Service are assisting the Division in developing comprehensive planning and appropriate Division expenditures which qualify for reimbursement under the federal aid to fish and wildlife programs.

Comprehensive fish and wildlife planning can function to assist state wildlife agencies in improving management and decision-making processes. It is a system for more effective management of fish and wildlife resources involving all fish and wildlife activities in particular and all activities which have an impact on natural resources in general. The key elements are (1) it focuses on output and benefits rather than input and activities and sets measurable objectives; (2) it is geared toward decentralization and thus involves key people at all levels; and (3) it evaluates alternative agency actions and selects those that are more cost effective.

Following formal acceptance of the Division's comprehensive planning proposal by the United States Fish and Wildlife Service, an Overview Committee was established within the Division to guide and monitor the planning effort. The Overview Committee is comprised of the Director and all senior staff members including District Wildlife Managers.

During the fiscal year, planners and other Division personnel began to develop a strategic fish and wildlife plan involving (1) a complete review of all fish and wildlife statutes, rules and regulations to redefine and confirm agency authority and responsibility; (2) the development of an updated statement of the agency's goal; (3) the identification of the animal species or habitat types that will be the focus for developing measurable program output (benefits); (4) the use of field, telephone and mail surveys for the purpose of assessing current and future usage, or use opportunities involving fish and wildlife and (5) the identification and assembly of specific resource data to enable forecasting of both supply and utilization of the state's fish and wildlife resources.

The Division's decision to enter into comprehensive planning was not made in haste. It was undertaken because of a deep-seated desire to employ the best decision-making methods available and to develop the same degree of performance in fish and wildlife management that is evident in the progressive business community.

Fisheries

Peter H. Oatis
Chief Aquatic Biologist

During Fiscal Year 1978, fisheries programs concentrated on evaluating trout management programs, surveying the Westfield River, evaluating strains of sea-run brown trout as well as assessing selected northern pike and smallmouth bass fisheries. Biologists also initiated projects that solicited the aid of volunteer groups such as Trout Unlimited and the Bass Anglers Sportsmen's Society in attempting to establish a fishery monitoring network. A statewide angler preference survey was conducted and the information gathered from it proved very helpful in the planning efforts of the fisheries staff. Finally, at least 88 Atlantic salmon returned to the Connecticut River, 23 of which were captured at the Holyoke fishlift.

Salmonid Investigations

Quabbin Reservoir continues to lead the state in salmonid harvest and production during 1977. The lake trout catch was the best to date with approximately 2,268 fish taken. Good numbers of rainbow trout in excess of one and one-half pounds each were also reported from Wachusett Reservoir, Lake Mattawa, Lake Onota, Ashumet and Johns Ponds.

Despite the fact that many were creeled prior to emigrating to local estuaries, adult sea-run brown trout captured in Cape Cod coastal streams demonstrated excellent growth rates and showed promise of becoming one of the state's more valuable salmonid resources. Interest in these fish is spreading and local volunteers of the Southeast Chapter of Trout Unlimited have donated considerable time and money, under Division guidance, toward improving access and cover along more than 1,800 feet of the Quashnet River, Falmouth.

A detailed survey of salmonid habitat in the Westfield River watershed was completed. Results indicate excellent reproduction of both brook and brown trout in the tributaries and upper reaches of the main branches. However, low flows and fast runoff preclude the establishment of larger trout in the lower reaches during the summer months with the exceptions of those reaches in the vicinity of cool tributary inflow.

Creel surveys conducted on the upper Deerfield River indicated that there is rapid exploitation of trout during the summer months and that trout numbers drop rapidly despite the fact that there is good trout-supporting water.

The fishery will be the subject of a future hearing relative to instituting catch-and-release regulations, perhaps for the 1979 fishing season.

Lake Studies

Considerable time and effort were directed at organizing and training volunteers for lake monitoring projects. Primary emphasis was in cooperation with the Lake Wyman and Lake Cochituate associations. Although these groups demonstrate a great deal of enthusiasm in the initial stages, many volunteers drop by the wayside when the routine aspects of monitoring lose their glamour. Contacts with groups such as Bass Anglers Sportsmen's Society show more promise in establishing a fisheries network.

A new Federally-aided lake survey study is being developed. Biologists on this project will monitor 50 lakes across the state per year and promulgate fisheries management recommendations based on data obtained.

Evaluation of tire reefs in natural ponds lacking adequate bass cover indicate that these structures are attracting and are being used by many species including bass. Plans are to apply this technique wherever it will be beneficial. Projects such as reef building and installation offer excellent projects for local residents and angling clubs.

Pike angling, particularly during the winter, continued to attract many anglers to the recently-stocked Brimfield Reservoir and Quaboag Pond areas. Anglers spent approximately 23,000 hours in 4,500 trips to catch 55 legal and 322 sub-legal pike at Quaboag Pond alone. Growth rates of these pike continue to be among the best in North America with some having attained a weight of 20 pounds in five years.

Five water supplies closed to angling were surveyed with special emphasis placed upon determining bass population statistics. This information provides excellent data on the mortality and growth rates of unfished populations; data which are vital for future fisheries management.

The fruits of ten years of concentrated effort and a great deal of money began to ripen with the known returns of at least 88 Atlantic salmon to the Connecticut River. Of these fish, 23 were captured at the Holyoke fishlift, 54 at the Rainbow Dam fishway on the Farmington River in Connecticut and 11 others at various locations within the watershed.

Despite the fact that all but five died prior to spawning, their return is certainly cause for excitement. Biologists are looking forward to 1982 when the first pure strain of Connecticut River salmon are expected to return. Approximately 130,000 smolt were released this year, 31,000 at Holyoke.

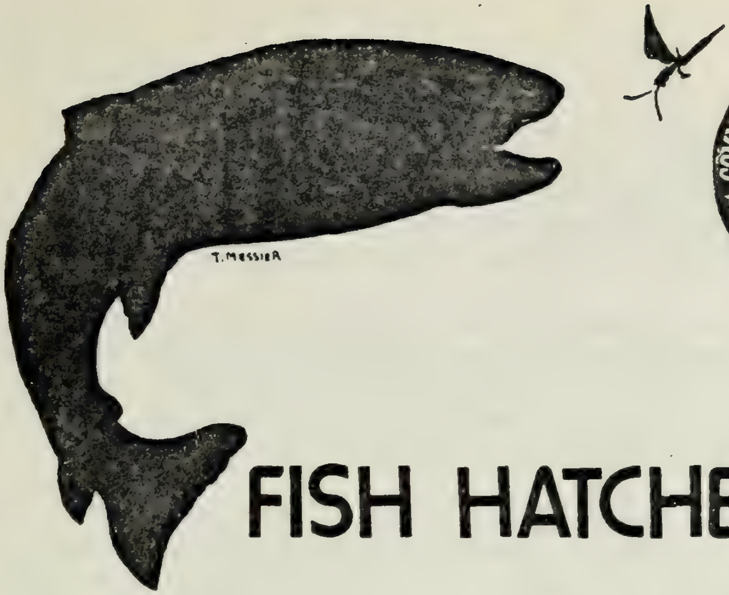
The shad run amounted to 144,700 this season. It is estimated that this represents about 35 to 45 percent of the shad population entering the river. The creel survey indicates that 4,200 anglers fished 11,250 hours to creel 3,600 shad. These results are significantly lower than last year but it is felt that this is primarily due to the nature of spring freshets and temperatures which allowed a short and fast run. Much of the access at Turners Falls was eliminated this year because of construction on the Cabot Station headgate fishways.

On the Merrimack fishway, plans are almost complete for the Essex Dam; hopefully plans for passage at Lowell will be resolved in the near future. Approximately 750 adult shad and 780,000 fertile shad eggs were released into the Hooksett pool to document hatching success and nursery habitat in the upper river. A total of 25,800 salmon smolts were also released just above the Pawtucket Dam at Lowell. These fish are expected to return in 1980 and will form a nucleus for Merrimack River brood stock.

Massachusetts Cooperative Fishery Unit

Studies conducted through the Massachusetts Cooperative Fishery Unit under the sponsorship of the Massachusetts Division of Fisheries and Wildlife are as follows:

Movement and Interaction Among Three Species of Trout (Rainbow, Brown and Brook Trout) in Cushman Brook, Massachusetts by S. E. Malone; The Relationship Between Phytoplankton and the Reproduction of Crustacean Zooplankton in Nature by O. R. Sarnelle; and White Sucker Population Dynamics in Two Streams in Western Massachusetts by S. P. Quinn.



COMMONWEALTH of MASSACHUSETTS ★ DIVISION of FISHERIES & WILDLIFE ★

FISH HATCHERIES

David Fredenburgh
Chief Fish Culturist

During Fiscal 1978, the hatcheries continued to undergo additional physical improvements financed with development monies.

The Sandwich Hatchery completed construction of a new hatch house and associated water supply equipment. A gravel-packed well was rejuvenated at the East Sandwich station and a chain-link fence was installed at the main station. Several meetings were held in anticipation of the proposed coho salmon hatchery to be constructed at East Sandwich. This new station is expected to produce coho salmon as well as sea-run brown trout.

The Sunderland Hatchery has undergone changes through the efforts of CETA employees assigned to the station. Starting in April, 12 workers were employed at Sunderland to complete jobs that otherwise would not be done by the normal work force. This includes such jobs as rebuilding ponds, cutting trees and brush, and painting which are scheduled to be completed by September.

The CETA program was also utilized at the Montague Hatchery. Four workers were assigned to that hatchery to clear brush, rebuild rearing ponds and build a storage shed. The Montague Hatchery experienced the worst case of vandalism that has occurred at a hatchery in recent history. Vandals destroyed about 10,000 yearling rainbow trout by blocking up the water supply. Plans are being formulated to prevent such losses in the future.

The McLaughlin Hatchery undertook to make some physical changes by the installation of chain-link fencing around the entrance perimeter as well as around the display pools. It is hoped that these minor security measures will reduce the number of after-hours visitors as well as occasional poaching. The hatchery experienced severe mortalities due to low pH conditions in the water supply coupled with poor quality feed. Culturists at the hatchery are presently trying to remedy both conditions.

The Palmer Hatchery continues to change toward production of Atlantic salmon. During the past year, water purification equipment has been purchased and installed and associated pumps, valves and pipes have been put in place for operations. It is expected that the hatchery will be operational during the fall of 1978.

Specialized programs such as production of coho and kokanee salmon, sea-run brown trout and the culturing of disease-resistant species continued to be high priority work at the hatcheries. Development of programs for specialized situations will very likely prove to be an important aspect of hatchery operations in the future.

As in the past, the hatcheries took advantage in utilizing all volunteers, individuals and groups to perform hatchery tasks. Other than the previously-mentioned CETA group, the hatcheries used volunteers from high schools and colleges. Used correctly, this type of assistance can be very beneficial. The hatchery section will encourage such programs in the future.

Production Figures, 1977-1978

	2-4"	6"	6-9"	9-12"	12+	Weight	Total
McLaughlin							
Rainbow	40,000	-	-	189,526	19,832	140,484	249,358
Brook	-	-	233,420	-	-	47,584	233,420
Brown	-	-	72,050	8,200	3,875	31,879	84,125
Totals	40,000	-	305,470	197,726	23,707	219,947	566,903
Montague							
Rainbow	-	-	-	66,900	-	60,295	66,900
Brook	-	-	-	22,200	-	12,509	22,200
Totals	-	-	-	89,100	-	72,804	89,100
Sunderland							
Rainbow	6,000	-	43,850	69,500	-	87,509	119,350
Brook	-	-	-	5,200	-	2,912	5,200
Brown	-	-	-	20,600	-	14,020	20,600
Totals	6,000	-	43,850	95,300	-	104,441	145,150
Palmer							
Rainbow	-	-	25,700	-	-	7,871	25,700
Brown	-	-	17,000	-	-	3,058	17,000
Totals	-	-	42,700	-	-	10,929	42,700
Sandwich							
Rainbow	-	-	60,700	60,075	-	58,575	120,775
Brown	-	12,325	-	6,000	-	7,172	18,325
Brook	-	-	20,000	-	-	4,004	20,000
Coho	-	30,269	-	-	-	1,413	30,269
Totals	-	12,325	80,700	66,075	-	69,751	159,100
Total (Coho)		30,269				1,413	30,269
Grand Totals	46,000	42,594	472,720	448,201	23,707	479,285	1,033,222

WILDLIFE

COMMONWEALTH of MASSACHUSETTS DIVISION of FISHERIES & WILDLIFE

Chet M. McCord
Chief of Wildlife Research

The Wildlife Research Section is charged with the responsibility of providing the Division with the information necessary to make sound wildlife management decisions. The task is one of monitoring wildlife populations as well as the environmental and social factors which influence those populations so that the status and trend of the wildlife resource can be known. When a wildlife population, for example, gets too low or too high, then it is this Section's job to recommend and provide supportive information on changes in regulation and management and to transmit these recommendations to the Fish and Wildlife Board. This year, those recommendations led to the following changes:

The cottontail season was changed to a zoned season with a mainland zone (20 October to 28 February) and a zone for Dukes County and Nantucket (15 November to 28 February). Previously, the season ran from 20 October to 28 February statewide. The season on the islands was changed to correspond with the long-established snowshoe hare season.

The snowshoe hare season was changed to a zoned season with eastern and western zones divided by the Connecticut River and a third zone consisting of Dukes and Nantucket Counties. Hunting in both eastern and western zones open 20 October. Closing date in the eastern zone remains on the traditional date, 5 February. As the western zone has superior hare habitat, the season there was extended to 28 February. The Dukes and Nantucket zone season now runs from 15 November to 28 February.

The jackrabbit season was contradictory in the law and regulation so the language was clarified and the season was shortened to compensate for the loss of black-tailed jackrabbit habitat. The season opens 15 November and closes on 31 December and is now limited to Nantucket Island.

The bobcat trapping season was shortened by about 60 days so that it now runs from 1 November to 31 December. The bobcat hunting season was moved away from deer week to open on 20 December and close on 8 March instead of 28 February. These changes were instituted to tighten the regulatory controls on the bobcat population in light of rising fur prices. A limit for both trapping and hunting seasons was set at 50 with a requirement that all pelts must be tagged before being sold. Carcass collection was instituted on a voluntary basis.

The fisher season was shortened to avoid overtrapping this vulnerable furbearer. Last year, 60 percent of the harvest was taken during the second half of the season. To relieve this pressure, the latter part of the season was eliminated. The current season opens 1 November and closes 31 December. Carcass collection was continued on a voluntary basis.

Clarification of antler length measurement for deer was necessary because there was no standard measurement to determine if a "spike" with antlers near the three-inch minimum was legal or illegal.

The upland game bird season was closed each day at one-half hour after sunset except on wildlife management areas to aid Law Enforcement personnel in controlling deer poaching.

Northeast Wildlife Management Area controlled hunt days were identified and the area was closed early on days before controlled hunts to allow undisturbed stocking of pheasants.

Written permission to enter bat caves was required to protect both humans and bats at the John F. Kelly Memorial Forest and wildlife management area in the Town of Chester.

Squirrel season regulations were changed to lengthen the season to close 2 January instead of 30 November in the eastern zone and to allow the use of rifles in the western zone. The season bag limit was also removed as the studies showed the expanded season would not damage the reproductive capabilities of the squirrel population.

Research activities of the Section during the fiscal year related to:

Squirrel Season Evaluation

The object of this study was to evaluate the one-year experimental squirrel season in order to determine the feasibility of an extended squirrel season for Massachusetts.

The Massachusetts squirrel season was changed in 1976 from a straight season from 20 October to 30 November to an eastern zone with the same dates and a western zone opening 13 September and closing 31 December. Additionally, rifles were banned statewide for squirrel hunting. The early western zone season (13 September to 20 October) accounted for 72 percent of the total hours hunted and 69 percent of the

total squirrels harvested. The western zone accounted for 87 percent of the total hours hunted. Telephone survey data in 1975 showed the percentage of squirrel hunters in both the eastern and western zones was 22 percent. However, with the new regulations in 1976, the percentage of squirrel hunters in the eastern zone dropped to 16 percent but increased in the western zone to 29 percent. Adults, spring juveniles and summer juveniles accounted for 56 percent, 25 percent and 19 percent, respectively, of the total harvest. Spring juveniles were present during the first week of the season. Adult females with enlarged mammary glands composed 23 percent, 23 percent, and 22 percent, respectively, of the total harvest during the first three weeks of the season and were practically absent after the eighth week. Approximately 7 percent of the females with enlarged mammary glands were judged to actually be nursing young, based on vascular development and external characteristics of the mammary glands. The early season appears to have increased hunting without adversely affecting the reproductive capabilities of the squirrel population.

Deer

During this fiscal year, the statewide harvest of deer taken during the fall of 1977 was 3,107 deer. This was an increase of 395 over the 1976 harvest of 2,712 and, as such, an indication that the herd is growing according to the Division's management objectives.

There are four separate deer seasons in the state. During the three-week archery season (7 to 26 November), archers reported taking 103 males and 39 females for a total of 142 deer. This was an increase of 15 over the 1976 harvest of 127. The six-day shotgun season (5 to 10 December) saw hunters reporting a total of 2,835 deer; 2,051 of them males, 784 females. This was an increase of 12 percent from the 2,534 deer harvested in 1976. The final deer season during which hunters used smooth-bore primitive firearms (19 to 21 December), 130 deer were netted, evenly divided between males and females (65 males and 65 females). This was almost three times higher than the 1976 kill of 49. No deer were taken during the special two-day hunt for disabled sportsmen.

Preparing for these seasons, the Division received over 34,000 applications for the 4,500 antlerless deer permits to be allotted. Sportsmen receiving these permits took a total of 1,018 deer; 107 adult males and 911 antlerless deer (including 173 button bucks or male fawns). In addition, 397 permits were issued to farmer-landowners who took 16 males, 6 button bucks and 46 females for a total of 68 deer. This brought the level of success for all antlerless deer permit holders to 1:4 on the mainland. On Martha's Vineyard, the success ratio was 1:5, while on Nantucket it was 1:3.

The breakdown of the 1977 deer season harvest shows that 70 percent of the harvest came from the four western counties, Berkshire, Franklin, Hampden and Hampshire. Worcester County contributed 9.5 percent of the state harvest and Barnstable County contributed 6.2 percent. The island of Dukes County reported 6.2 percent of the harvest while another 6.2 percent were reported from Nantucket. Deer management Zones I and II contributed only 3.4 percent of the overall statewide harvest.

In an assessment of non-hunting deer mortality, from 1 January 1977 to 31 December 1977, natural resource officers reported 511 deer killed. Of these, 208 were males, 267 females and 36 were reported with no indication of sex. The major cause of mortality was collisions with motor vehicles which accounted for 341 fatalities. Dogs killed 73 deer and 57 deer were taken illegally by poachers. Twenty-eight deer died of unknown causes and 12 of a variety of other causes.

Statewide Small Game Harvest

A random sample of 400 small-game hunters (two subsamples of 200) licensed in 1977 was surveyed by telephone to determine their harvests and participation in hunting. Additional special questions concerned deer, squirrel and raccoon hunting.

Response data were transferred to computer cards and are in the process of being tallied by cooperators.

Beaver

A total of 1,666 beaver was taken by 165 trappers in 120 towns during the 1977-1978 season. This is the second highest take on record and the record number of successful trappers. This take was significantly higher than either the 1976-1977 take or the five-year (1973-1977) average take. Two of five western counties (Worcester and Franklin) showed statistically significant increases; however, a third county (Berkshire) showed no significant change, and two others (Hampshire and Hampden) showed statistically significant decreases. Pelt prices dropped sharply to an average of $14.66 per pelt for an estimated harvest valuation of $24,423.56.

Otter and Fisher

During 1977-1978, a total of 163 otters were taken by 72 trappers in 72 towns for a mean of 2.3 otter per successful trapper. This compares with a take of 110 and a mean of 1.7 for 65 successful trappers in 1976-1977. The fisher take increased despite a two-month reduction in the season, from 25 in 1976-1977 to 37 in 1977-1978, with 21 trappers taking fisher in 26 towns for a mean of 1.8 fisher per successful trapper. Worcester (50) and Berkshire (43) Counties provided the most otter while Worcester (15) yielded the most fisher. Otter were taken primarily in November and December and fisher primarily in November. A total of 95 otter and 12 fisher carcasses were received from cooperating trappers. Initial results of tooth sectioning were inclusive due to staining problems and teeth are being recut. Thirty-eight (38) other reproductive tracts showed a mean of 1.05 corpora lutea each.

Mourning Dove

Calling doves were counted on three "randomized" routes in cooperation with the U. S. Fish and Wildlife Service's annual mourning dove breeding population census. The number of calling doves increased on two routes and decreased on one, with the total for all three routes increasing 35 percent from 1976 to 1977.

Turkey

Turkey populations in the southern Berkshires remain concentrated around the Beartown State Forest area, but dispersal continues to occur at a good rate except to the east. Based on the extent of sightings, production appears good. Few mortalities were reported during the severe 1977-1978 winter. Turkeys continue to be reported in northern Berkshire and Franklin Counties, probably as a result of influx from neighboring states. Planning should be initiated for a future open season on turkeys.

Black Bear

Applications for bear hunting permits were received from 441 sportsmen. No bear were reported taken during the open season, possibly reflecting early denning by the bears. One road kill was reported. New reports of 33 observations totalling 50 bear were received from 18 towns. Sows with cubs were reported from three locations. Three nuisance complaints were investigated.

Waterfowl

Gosling Transplant Program

A snowstorm on 10 May, which left 150mm of wet snow, resulted in nest desertion by a number of Canada geese. Only nine goslings were observed in the Southboro-Framingham flock and only a single bird hatched off at Bristol-Blake in Norfolk. As a result, no transplants were made. The June census indicated only 90 geese down from 110 last year and 191 in 1973. No nest checks were made of transplant sites.

Preseason Waterfowl Bandings

A total of 975 birds were banded by airboat nightlighting, bait trapping and net trapping during the 1977 preseason banding segment. This total includes 117 hand-reared wood ducks. Wild-banded waterfowl include 274 wood ducks, 175 mallards, 125 black ducks, 8 mallard x black hybrids, 66 green-winged teal, 26 blue-winged teal, 10 hooded mergansers and 1 mallard x domestic hybrid. Also banded were 3 sora rails and 2 gallinules. A cooperator banded an additional 104 least, 21 semi-palmated, 14 solitary, 12 spotted and 3 pectoral sandpipers, 5 semi-palmated plovers, 7 killdeer and 2 lesser yellowlegs.

Airboat operations were curtailed in mid-September due to a damaged propeller.

Winter Inventory Flights

A total of 158,540 waterfowl were counted during the January 1978 winter inventory, up 36 percent from 1977 and up 62 percent over the previous ten-year average. Black duck numbers (30,711) were up 56 percent over 1977, and up 73 percent from the ten-year average. Canvasbacks and goldeneyes were down from 1977, but only goldeneyes fell below the ten-year average. All other species were up. Mergansers and mallards showed exceptionally large increases.

Winter Trapping Program

The winter of 1977-1978 was moderate and typical of most winters in Massachusetts with periods of severe cold broken by warm spells. As a result, most bays and harbors remained open or were iced in for only brief periods of time, unlike last year when these same areas remained ice-locked for several weeks. Black duck wintering counts were the highest since 1969 with nearly 31,000 birds counted during the winter inventory flight.

Division personnel and their cooperators banded a total of 551 black ducks, 89 mallard x black hybrids, 39 mallards, 7 green-winged teal, 6 pintail and 1 wigeon.

Black Duck Imprinting Program

This project has been completed. A manuscript detailing the results of the five-year study was submitted for publication. Attempts to develop cylinder-using populations of black ducks in order to reduce nest destruction were unsuccessful.

Park Waterfowl Investigations

A park mallard winter census was last run in 1973 when 9,671 mallards and 1,888 black ducks were counted at 116 locations in 13 cities and 55 towns. In order to determine if the park waterfowl population has changed during the last five years, the census was repeated during 7 to 19 January 1978. A total of 11,952 mallards, 1,690 black ducks, 109 American wigeon and 16 pintail along with a few ringnecks, wood ducks, green-winged teal and hooded and redbreasted mergansers were counted at 126 locations in 12 cities and 54 towns during the 10 to 19 January survey period.

In order to determine if the winter population had increased or decreased in the state during the last five years, 25 areas were selected for their stability. These areas were isolated from each other and included no new sites that were censused in 1978 but not in 1973. The 1973 count for this segment of the population was 5,232 mallards and 939 black ducks. The 1978 tally was 5,156 mallards and 560 black ducks, decreases of 1.5 and 40.4 percent respectively. The mallard decrease is insignificant. The black duck counts during both surveys are questionable since the biggest flocks of blacks were from coastal locations where "park" blacks trade back and forth between mallard flocks and "wild" wintering black ducks. Thus it is difficult to positively identify certain groups of park black ducks. This problem does not exist on isolated inland park type situations.

Wood Duck Dump Nesting Study

Three hens that established their own nests were confirmed as previously laying in nests that were eventually incubated by other hens. Four other hens suspected as dump nesters also established their own nests. Two hens confirmed as dumping eggs, were never found incubating. The results of this study will be summarized for the 1976 to 1978 period.

The techniquesused in marking dumping wood ducks were published in the Journal of Wildlife Management (Vol. 42, No. 2; pp 29-32, 1978).

Evaluation of Starlingproof Nesting Structures

Skylights, 100 x 100mm, built into the tops of wood duck boxes proved to be of questionable value as a starling deterrent. Wood duck acceptance of light-lid equipped boxes was satisfactory and starling usage on eastern study areas was low, but on areas in the western half of Massachusetts, starlings used the skylight boxes as readily as they did control boxes and wood duck acceptance was poor.

Release of Hand-Reared Wood Ducks

A total of 53 immature birds were released on Nantucket Island where a box erection program by private groups commenced in 1977. An additional 52 birds, raised by a cooperator, were released in Berkshire County.

Coastal and Inland Wetlands Survey

Wetland complexes, identified on black and white topographic sheets by color coding, were given eight-digit identification numbers. These wetlands will eventually be recorded on computer cards to allow easy information retrieval.

Relationships of Canada Geese to Commercial Shellfisheries

Sixty-five percent of questionnaire respondents reported problems with Canada goose/shellfish depredations. Field observations could not support these claims although depredations by mallards, black ducks and a herring gull were observed.

Massachusetts Cooperative Wildlife Research Unit

Studies conducted through the Massachusetts Cooperative Wildlife Research Unit under the sponsorship of the Massachusetts Division of Fisheries and Wildlife were "Acclimation of Stocked New Brunswick Hare (Lepus americanus) in Massachusetts" by W. Shultz; "Land Use Changes and the Massachusetts Deer Herd" by P. J. Sczerzenie and "A New England Animal Identification and Damage Guide for Urban, Suburban and Agricultural Areas" by J. Harding.

COMMONWEALTH of MASSACHUSETTS DIVISION of FISHERIES & WILDLIFE

GAME FARMS

E. Michael Pollack
Chief Game Biologist

During this fiscal period, major pen construction was accomplished at the Ayer Game Farm. The CETA program was of great aid in supplying labor. All pens destroyed by the previous winter storms were either repaired or replaced with new pens.

Other major construction projects were conducted at the Wilbraham Game Farm where new brooder yard pens were built and repairs made to roofs, electrical and water systems.

Game bird production was higher than scheduled due to various factors including better disease control and other good management techniques; however, heavy, freezing rains during the distribution season resulted in deterioration of pheasants. Tails were lost as a result of becoming wet, being matted and frozen to the ground.

All game bird feed formulas were updated in search of better nutrition and lower food costs. However, feed costs continued to climb but not as sharply as in previous years.

Game Farm Production

1977-1978

Pheasant

	SR	A	B	C	PG	Misc.	Total
Sandwich	170	-	1,804	5,286	6,286	-	13,546
Wilbraham	1,925	-	4,816	5,892	7,520	115	20,268
Ayer	2,580	100	2,940	4,240	28,604	100	24,758
Totals	4,675	100	9,560	15,418	28,604	215	58,572*

* Does not include approximately 800 field trial birds or 5,000 adult brood stock released in early summer.

Quail

A total of approximately 3,000 quail, produced at the Sandwich Game Farm, werereleased on wildlife management areas in the Southeast District.

White Hare

A total of 840 white hare, purchased from a source in New Brunswick, were released during this period.

COMMONWEALTH of MASSACHUSETTS DIVISION of FISHERIES & WILDLIFE

ORNITHOLOGIST

Bradford Blodget
State Ornithologist

Legislative Work

One of the ornithologist's chief occupations in 1978 was in efforts to prepare and guide passage of a non-game, threatened and endangered species bill, originally filed by the Division and later re-drafted and filed in Senator Carol Amick's name as S-1496. The ornithologist attended and chaired numerous meetings during the year to arrive at language acceptable to the many parties interested in this bill. The chief features of this bill were (1) establishment of a non-game, threatened and endangered species advisory council of seven members appointed by the Secretary and charged with the task of advising the Director on matters pertaining to non-game; (2) authorization of the Director to conduct specific investigations into non-game species of wildlife as well as wild plants; (3) promulgation by the Director of a list of threatened and endangered species of wildlife and wild flora within the Commonwealth, as well as rules and regulations to effect appropriate conservation of same; (4) provisions for the Director to carry out full-scale conservation programs for non-game species including acquisition of land; (5) establishment of penalties and fines; and (6) creation of a non-game fund to bear all expenses of the non-game program and to which would be credited annually $120,000 from the State Recreational Areas Fund and $30,000 from the Metropolitan District Commission's Parks District Fund, as well as all special gifts, grants-in-aid, and so forth.

This bill did not pass and the ornithologist has continued to work closely with Senator Amick's Special Endangered Species Study Commission to draft legislation for 1979. At this time, it appears that the bill will be re-filed in the 1979 session with the same wording as the 1978 version (S-1496). However, the funding provisions are being re-examined with the possibility of going to a voluntary check-off scheme on income tax refunds, a system which proved successful in Colorado.

The ornithologist also monitored H-83, a bill amending Chapter 131, Sections 4 and 5, to extend the Division's authority to investigate and regulate reptile and amphibian populations. This is important since no species of reptiles and amphibians are currently protected including many rare species of special concern; e.g., the bog turtle, Plymouth red-bellied turtle and timber rattlesnake. Other species such as the bullfrog, spotted salamander and snapping turtle are presently subject to unregulated commercial harvest.

S-810, a bill amending Chapter 131, Section 26A, to afford full protection to all endangered species listed by the U. S. Fish and Wildlife Service in the Federal Register, was closely followed. This bill would, in effect, deregulate certain species such as the American alligator which have been delisted by the U. S. Fish and Wildlife Service as well as deregulate certain species of caiman, thereby legalizing them for trade. While this means that certain species now protected would have been removed from the list, the total number of species protected would, in fact, have been increased enormously by adoption of the U. S. Fish and Wildlife's list of threatened and endangered species of wildlife and plants. The existing statute would have been improved by giving it flexibility to change as additions and deletions are made to the Federal list.

February was completely devoted to the Division's 1978 legislative package as the chief planner, who ordinarily handles legislative affairs, was called to jury duty. The ornithologist attended most hearings of the Committee on Natural Resources and Agriculture and testified on over 40 bills on a variety of subjects affecting the Division. In these activities, the Division was fortunate in having the assistance of Julie Post, an intern from Pine Manor College.

In addition, the ornithologist monitored the progress of the Federal non-game bill, H.R. 10255 which, had it passed, would have made funding available to the states to develop strategic plans for non-game species.

On 4-6 October, the ornithologist attended and addressed a meeting on non-game species sponsored by the Northeast Section of the Wildlife Society at the Wetlands Institute in Stone Harbor, New Jersey. At this meeting, representatives of various states discussed their programs, funding and legislative matters pertaining to non-game work.

Education

During the 1978 year, the ornithologist presented programs on some of the Division's non-game activities to the Nature Training School in Paxton, the Cape Cod Bird Club in Brewster, the University of Massachusetts Chapter of The Wildlife Society in Amherst, the South Lancaster Academy in South Lancaster and the Massachusetts Wildlife Federation in Bedford. He is currently engaged in development of a slide presentation dealing with non-game birds which will be used in conjunction with 1979 efforts to pass the non-game bill.

Oil Spills

We were fortunate in 1978 in not having any major oiled bird emergency. The most serious situation arose following the grounding of the "Global Hope" in Salem Harbor during the February blizzard. In response to this, I worked closely with the U. S. Coast Guard Strike Team and Al Jackson of the U. S. Fish and Wildlife Service. A collection station was established at the Massachusetts Division of Marine Fisheries Cat Cove Station, to which the public was instructed to bring all birds rescued. Only four birds were brought in. On a recovery operation with the U. S. Coast Guard, James Cardoza and the ornithologist ascertained that most bird mortality occurred on Cat Island, North and South Gooseberry Islands and other islands in outer Salem Harbor. The final estimate of oiled birds associated with this spill was fixed at 110 birds, 102 of which were common eiders, 29 of which were known victims. Thirteen birds were recovered--a common loon, a rednecked grebe, a mallard, nine common eiders and a redbreasted merganser. All succumbed but the rednecked grebe which was rehabilitated at the Massachusetts Audubon Society, Lincoln, and later released.

Some of the "Global Hope's" oil is believed to have remained in Cape Cod Bay for the duration of the winter with oil coming ashore in Truro and Wellfleet on outer Cape Cod. Little mortality of birds could be demonstrably associated with this spill.

Two small inland spills were investigated, one at Hyannis and the other at Institute Pond in Worcester, both of which were promptly cleaned up and did not result in serious mortality.

On 11-13 January, the ornithologist attended a conference entitled "In the Wake of the Argo Merchant" at the University of Rhode Island's Center for Ocean Management Studies.

Tern Management Program

A draft planning document detailing 44 known tern colonies, their present ownership, management agency, other cooperators and pertinent access information has been prepared. Of the 44 colonies, 23 colonies now managed by the Massachusetts Audubon Society, are slated to come under Division management in 1980.

The ornithologist visited four tern colonies in 1978--Tinker's Island, Salem (50 pairs of common terns), Fairhaven Salt Marshes (Massachusetts Division of Fisheries and Wildlife property, with eight pairs of least terns), Third Cliff, Scituate (30 pairs of least terns), and Forth Cliff, Scituate (10 pairs of least terns).

On 9 August, the ornithologist coordinated a statewide meeting of tern wardens and agencies involved in tern conservation at the Cape Cod National Seashore for the purpose of assembling statewide census data and assessing the status of the populations in the Commonwealth.

A total of 1,424 pairs of least terns in 36 colonies was recorded, with some particularly large concentrations at Nauset, Eastham and Orleans (229 pairs), Nantucket (270-plus pairs), Kalmus Beach, Hyannis (70 pairs), Crane's Beach, Ipswich (63 pairs) and Duxbury Beach, Duxbury (60 pairs).

This species is geographically the most widespread and appears to be stable in numbers. Common terns numbered 4,119-plus pairs in 22 colonies, off eight percent from 1977 even when missing data are considered. The largest colonies of this species were 1,900 pairs in the Monomoy Wilderness, Chatham, 500 pairs at Bird Island, Marion, 515 pairs at Gray's Beach, West Yarmouth, 350 pairs at Plymouth Beach and 260 pairs at New Island, Orleans and Eastham. Roseate terns totaled 1,608 pairs at six locations, with 77 percent (1,290 pairs) concentrated at Bird Island, Marion, and 18 percent (290 pairs) in the Monomoy Wilderness, Chatham. No Man's Land, Chilmark, and the Monomoy Wilderness remain the strongholds for the Arctic tern with 20-plus and 15 pairs respectively out of a state total of 53 pairs in five colonies.

Breeding Bird Atlas

During the year, the ornithologist has worked closely with Richard Forster of the Massachusetts Audubon Society in planning the future of the Breeding Bird Atlas. Costs of computerizing and publishing the data have been derived. A large cadre of volunteers continued to work the 989 atlas blocks. Most of the blocks are now covered. The ornithologist personally covered a set of 36 undercovered blocks centered in the Brookfields. The district offices also contributed data. All data are currently stored on master sheets at the Massachusetts Audubon Society headquarters in Lincoln. Because of the amount of field work remaining, a decision was made this year to extend the field work for one more season.

Already the data generated from this effort have proved useful in attempting to assess the bird populations in Environmental Impact Statements and to emphasize species in the state which are geographically restricted.

Exotic Animals Task Force

In May, the Director established a special task force to review all laws and regulations covering the possession of exotic animals, with the ornithologist serving as chairman. At this writing, expanded husbandry and maintenance regulations have been drafted and final recommendation for revisions of the "Exemption List" should be completed soon. Target date for completion of the Task Force report is 31 January 1979.

Cooperative Endangered Species Agreement

On 5 September, a letter of application was filed with the U. S. Fish and Wildlife Service for a cooperative agreement under Section 6 of the Federal Endangered Species Act of 1973. If approved, the Massachusetts Division of Fisheries and Wildlife would be eligible for two-thirds grant-in-aid reimbursal of approved projects.

The ornithologist will continue to supply materials to the Service to assist in their evaluation of the Division's qualifications to enter such an agreement.

Coastal Dredging Projects

During the course of the year, the ornithologist reviewed copies of project applications received from the U. S. Army Corps of Engineers. Many project descriptions involve pier construction or rip-rap installation and have little bearing on wildlife. Of principal concern are the dredging operations which can have both beneficial and deleterious effects on wildlife (specifically sea birds). During 1978, the ornithologist inspected a dredging rig operation in progress at Harding's Beach Point, Chatham. The spoil deposition on the point should provide an excellent substrate for nesting least terns in 1979.

Nuisance Animal Services

An enormous amount of time was spent over the past year answering telephone inquiries regarding skunks, raccoons, squirrels, pigeons and other nuisance animals. Over 246 complaints were handled at Boston for the period January to September 1978 through telephone consultations.

Other Activities

List of Birds of Massachusetts. Despite the fact that the birds of Massachusetts have been heavily studied and are for the most part very well known,an official up-to-date list of the birds of the Commonwealth has been lacking. During 1978, the ornithologist prepared such a list. This document includes 415 species that occur or have occurred in Massachusetts, as well as ten others of "hypothetical" status. A total of 200 species are indicated as having bred in Massachusetts at some time. This list also indicates species which are rare, local or infrequent as breeders, as well as a frequency for each species; e.g., vagrant, migrant, or winter resident. Infrequent vagrants that have appeared on six or fewer occasions since 1900 are detailed in an appendix. It is intended that this list will be maintained and revised annually.

List of Species for Special Consideration in Massachusetts. The office received about 110 requests for information on endangered species during 1978. This specialized list is broken down into three parts. Section I, listing Federally "threatened" and "endangered" species that occur in the Commonwealth as well as other species that the Division has recommended to the U. S. Fish and Wildlife Service, should be so classified; Section II listing state local and state rare species; and Section III, peripheral species.

Worcester County Field Records. In addition to regular work assignments, all 1977 field records were processed during the January to April period, edited and published in "The Chickadee," a journal of the Forbush Bird Club.

Western District

Winston S. Saville
District Wildlife Manager

Western District personnel stocked 5,350 cock pheasants and 363 hen pheasants during 1977-1978. Approximately one half of the cock birds were stocked on Division-owned or leased property. White hare were received by the district in February of 1978 and a total of 175 were stocked into covers in the southeast section of the district.

Spring woodcock census routes were run in the towns of Hancock and Worthington. The woodcock run in Southwick was not completed this year. As in previous years, spring mourning dove census routes were run in the towns of Granville, Lee and Lenox.

Wood duck management within the district included maintenance of 76 nesting boxes, the construction of 35 nesting boxes, the monitoring of 20 research nesting boxes and the release of 50 preflight wood ducks. Live trapping and transplanting of beaver is a major district activity, particularly during the summer months. During this fiscal year, beaver were live trapped from 47 colonies. In all, a total of 46 beaver were captured and released into more remote portions of the district.

The district received five reports of bear damage or problems; two beehive destructions, one vegetable crop (corn) damage, one turning over of trash barrels in a roadside parking area, one series of continuous bear sightings near a residence.

Wild turkeys are doing well in the Beartown State Forest and they are dispersing into the surrounding areas. Sightings of turkeys have been reported throughout the district, particularly along the New York and Vermont state lines where other successful wild turkey restoration programs are being conducted.

In fishery-related activities, district personnel stocked 152,525 brook, rainbow and brown trout during this report period. The district's fall trout stocking program in 1977 again involved the release of a total of 7,000 brown and 10,000 rainbow trout into the district's better lakes and waters. No kokanee salmon fingerlings were stocked during this report period due to the total egg mortality at the hatchery.

Summer activities included pond surveys with emphasis on bass management. Other points of focus included investigation of the chemistry of stocked ponds, collection of fish samples for PCB analysis, and investigations of polluted waters. Several days were spent on the F-34-D project on the Peru Wildlife Management Area. This project provides for and maintains access to streams on Division-owned properties.

The fisheries manager also worked with the Hawley State Forest Conservation Camp presenting a program on fish management techniques to 70 youngsters.

During the year, the Western District added 113 acres to the Division's wildlife land holdings, bringing the district total to 11,144 acres. The purchase, made this year, was made as part of the Peru Wildlife Management Area. Approximately 100 acres of the acquisition is in a fresh-water marsh, making it a most important addition to this mostly-forested management area.

Maintenance, this year, included activities on seven wildlife management areas, including installation of 70 signs; maintenance of 1.2 miles of trail on the Canada Hill, Moran and Peru wildlife management areas; posting of six miles of boundary, two miles each on the Housatonic Valley, Moran and Hinsdale Flats wildlife management areas; cutting brush on six acres of the Housatonic Valley Wildlife Management Area; planting 500 arborvitae on the Housatonic Valley Wildlife Management Area and 200 white spruce on the Hinsdale Flats Wildlife Management Area; and maintenance of five parking lots on the above management areas.

During this report period, nine buildings were removed from the Moran Wildlife Management Area and two were removed from the Hinsdale Flats Wildlife Management Area. Most of the buildings had been completely vandalized. They were removed for aesthetic and safety reasons. One building was salvaged for lumber, the others were used for training exercises by local fire departments.

A five-year farming contract was initiated on the Hinsdale Flats Wildlife Management Area. This will allow the farmer to cut and maintain a hay crop under conditions that will leave a stand of hay sufficient for pheasant cover in the fall. Similar contracts are contemplated for the Moran and Housatonic Valley wildlife management areas.

The district headquarters was remodeled during this fiscal year. A storage room that was part of the original building was converted into a bunk room, a small storage room and a meeting room and office combination.

As might be expected, public relations activities were many and varied. Possibly the high point of this reporting period was the dedication of the Division's property in Windsor as the Eugene Moran Wildlife Management Area. Dedication of the public access fishing pier at Onota Lake, Pittsfield, was another well-attended event.

District personnel attended an average of two County League and sportsmen's club meetings a month in addition to attending meetings of community service clubs, such as Lions, Rotary, Kiwanis and Boy Scouts. Lectures and slide programs were presented at the Central Berkshire Regional School District and Berkshire Community College. There were also several meetings relative to a trout stocking program for Russell Pond and a meeting relative to the problem of posted land in Tyringham.

Division personnel maintained the permanent wildlife exhibit at Mt. Greylock's visitor center in Lanesboro and provided staff for exhibits at the Eastern States Exposition and the Western Massachusetts Sportsmen's Show. In addition, district personnel attended meetings with the Soil Conservation Service, Soil Conservation District, Scenic Rivers, Berkshire County Regional Planning Board and the Division of Law Enforcement.

The Western District contributed to the completion of a natural resource inventory for the Town of Heath in this report period.

The Division of Fisheries and Wildlife also co-sponsored the first annual Housatonic River canoe race.

Connecticut Valley District

Herman Covey
District Wildlife Manager

The Connecticut Valley District covers 49 towns on both sides of the Connecticut River from the Vermont and New Hampshire borders to the Connecticut state line. There are three counties in this region and the district takes in parts of all three, with the remaining sections of the three counties falling into the Western District. The region is blessed with trout streams, lakes and ponds and is traversed by a number of scenic highways. The countryside boasts the rich farmlands of the valley proper surrounded by rolling hills and some mountains. The Division has five installations in this area aside from the district headquarters; Wilbraham State Game Farm and fish hatcheries at Montague, Sunderland, Belchertown and Palmer. These are primarily trout-rearing facilities, but the station at Palmer is currently being converted to production of Atlantic salmon.

The district is staffed by a district manager, game manager, fisheries manager, one skilled conservation helper and three conservation helpers.

During Fiscal 1978, the Valley district staff pursued regular and traditional management and maintenance operations. One of the most visible of these is the stocking of pheasant, hare and trout. Twelve thousand eight hundred fifty-six (12,856) pheasants were stocked during this year; 2900 of these birds were stocked in open covers prior to the open season, 6024 were stocked during the season. An additional 3932 birds were stocked on wildlife management areas. Sportsmen's clubs in the area received 1525 cocks and 80 hens to be used in their pheasant rearing program and a surplus brood stock of 484 cocks and 1174 hens was released to selected covers throughout the district in the hope that they could continue natural production in the wild. One hundred eighty (180) hare were stocked in open covers during this period. Hare are stocked to augment native populations and to establish hare colonies in suitable habitat.

Trout stocking is tallied by the calendar year rather than the fiscal year, so figures available are those for calendar 1977. During this period, a total of 177,515 trout were stocked--112,470 into streams, 65,045 into ponds--weighing a total of 82,774 pounds.

In addition to stocking, the district's fisheries staff assisted in Division (and other) research projects participating in the transport of Atlantic salmon from Vermont to Connecticut, assessment of fish resources in the Quabbin Reservoir, and surveying fishermen and their catch. They participated in netting and creel census associated with the northern pike project, assisted in the Connecticut River shad and Atlantic salmon projects, and provided manpower for the procedures involved in a largemouth bass inventory. Concurrently, they monitored water chemistry on many ponds, investigated fish kills and participated in workshops.

District personnel also assisted Division biologists in many wildlife research projects, among them wood duck field studies. Wildlife problems reported to the district were investigated and the staff trapped, removed and relocated numerous beaver and raccoons in addition to dealing with instances of problem ducks and geese.

During the deer season, district personnel operated deer checking stations and assisted law enforcement officers by supplying men for full-time patrol duty. Cooperation with law enforcement was carried on throughout other hunting and trapping seasons as well. District personnel also recorded and tagged pelts of beaver, bobcat, otter and fisher.

Other efforts within the district focused primarily on maintenance and improvement of lands and property. Four Adirondack shelters were installed on the Swift River management area, logging was carried out on some areas and two pheasant racks were constructed for carrying birds on trucks. Roads and grounds were maintained and areas were posted with Division signs. Barways and gates were kept in good repair and equipment was maintained on an ongoing basis.

To keep the public apprised of the activities within the district, the district office issued area new releases and participated actively in local Hunting and Fishing Day observances as well as the Western Massachusetts Fly Tyers workshop. It was personnel from this district who built the Division's exhibit shown at the Eastern States Exposition in Springfield and the Sportsmen's Show in Boston and who provided the bulk of maintenance for the exhibit while it was housed in Springfield. On other occasions, district staffers conducted classes and field trips for students from Holyoke Community College, regional high school and the University of Massachusetts Wildlife Unit. The district manager participated in numerous meetings with such diverse groups as Hampden, Hampshire and Franklin County Sportsmen's Councils, the U. S. Army Corps of Engineers, classes from the University of Massachusetts and the Smith school, Westfield River Watershed Committee, Greenfield YMCA and regional law enforcement hearings.

In addition to ordinary management and public contact activities, during 1977-1978, the district manager became deeply involved in the CETA program and was instrumental in securing CETA assistance for the entire region. In this capacity, he participated in planning and implementation of a project designed for the Wilbraham State Game Farm. The first project scheduled at the game farm was extended to a full year and the contract was expanded to $92,000. Thirteen positions were initiated and the crew began rebuilding the Wilbraham installation. A second project, planned for the same facility, involved 12 positions and $73,000 for the purpose of upgrading the farm. This project, too, has been implemented.

A third project was designed and initiated for the Palmer Experimental Salmon Station and the Swift River Wildlife Management Area. Twelve positions and $73,000 of contract funds have been allocated for this project. At the hatchery, crews under this program provided general repairs and development aimed at refurbishing that hatchery. At Swift River, the crew engaged in a variety of forestry activities including construction of a woods road, thinning of dense stands, cutting along woodland borders, and some general logging. In addition, the crew installed culverts as needed, repaired a decaying water control structure and built a new pond complete with flashboard control and suitable for waterfowl nesting.

These projects have been notably successful not only in improving the Commonwealth's wildlife lands and facilities but also in providing on-the-job training to participants in many different areas. Among the skills acquired, all participants attained Class II driver's licenses. Skills and experience gained have enabled participants to qualify for a greater variety of jobs.

Based on these successful projects, all of which have been extended to one year--the maximum allowable--the manager was asked to assist the Chief Fish Culturist in planning a project for the upgrading of hatcheries at Montague and Sunderland. This was accomplished with 16 positions established under the CETA program including funding of $92,000. This brings the total CETA participation in the Valley District to four projects totaling $450,000 with the bulk of those funds being paid out as salary to CETA employees who are acquiring new skills.

Central District

Carl S. Prescott
District Wildlife Manager

During Fiscal 1978, personnel from the Central District worked on the development and maintenance of six wildlife management areas. Much time was spent at the new Bolton Flats area with four parking lots being developed and a footbridge being erected over the Still River. Four major identification signs were constructed and erected and 54 other boundary and informational signs posted. Eight hundred wildlife trees and shrubs were planted and four local farmers were signed up for five years under cooperative farming agreements. These agreements are designed to allow the use of agricultural portions of wildlife management areas with an assurance that suitable food and cover crops will be left for fall and winter resident and migrant wildlife species. The district now has 11 farmers working on six different areas.

Other areas receiving district attention during Fiscal 1978 were Birch Hill, Quaboag, West Hill, Barre Falls and Hubbardston. One hundred fifty-three acres of herbaceous seeding, two acres of clearings and six acres of vegetation control were completed on these areas. Four hundred eighty-nine signs were produced and maintained.

The district maintained 164 wood duck nesting boxes and added 17 new ones to new areas. It received 22 beaver complaints and trapped and relocated three animals. Fifty other types of nuisance animal complaints were received and three required direct district assistance. Twenty-three live traps were loaned and advice was given to the other complainants.

Forty-seven towns and 11 wildlife management areas received pheasants. In all, 18,292 birds were released. In addition, 2,055 club birds were released bringing the total of pheasants released in the district to 20,347. One hundred six snowshoe hare were also liberated.

In the fall of 1977, ten ponds and seven streams were stocked with 16,000 rainbow trout. During the spring of 1978, 107 streams and 30 ponds received 58,000 9-inch plus and 20,000 6 to 9-inch rainbow trout, 4,300 9-inch plus and 20,000 6 to 9-inch brown trout, and 6,200 9-inch plus and 46,000 6 to 9-inch brook trout. A major public relations problem developed over the reduction of numbers of trout allotted to Lake Quinsigamond caused by a serious sewage problem during the spring of 1978.

Yearling largemouth bass were released in Putnam Park in Rutland and the Buck Hill conservation area in Spencer. The district fisheries crew sampled the Quinapoxet Reservoir. Additional samples were collected at Wekepeke Brook to obtain further data about the brook in preparation for evaluating the impact of the construction of I-190 on its aquatic life.

District representatives attended 41 meetings during Fiscal 1978 including meetings with the Department of Public Works in relation to the construction of I-190, meetings with the Division of Law Enforcement, the Worcester County League, the Corps of Engineers, conservation commissions, and so forth. The district participated in staffing the Eastern States Exposition and the Boston and Boxborough sportsmen's shows. Thirteen speaking engagements were accepted and delivered. District personnel participated in two radio shows and over 30 newspaper articles were written with information provided by district personnel.

Northeast District

Walter L. Hoyt, Jr.
District Wildlife Manager

The Northeast District performed its primary functions of stocking fish, pheasants and varying hare; of managing seven wildlife management areas and five sanctuaries; of providing all forms of public information; of providing wildlife services; and of taking the initial steps in the purchase of land. Some 6,556 pheasants, 86 varying hare and 250,000 trout were released to augment native populations. An additional 500 pheasants were released through the sportsmen's rearing program. Roads, trails, clearings, parking lots, boundaries and signs were maintained on wildlife management areas. New openings, trails and roads were developed as planned in the W-9-D and F-34-D programs.

The Northeast District continued to be the only district to conduct two controlled hunts; one for waterfowl at the Delaney Wildlife Management Area and one for upland game at the Northeast Wildlife Management Area. Approximately 200 permittees used the target range at the Northeast Wildlife Management Area. Wilderness camping, primarily at the Squannacook Wildlife Management Area, drew approximately 400 campers, mostly Scouts.

The five sanctuaries, four of which are islands, were posted to safeguard and insure their primary intent. In addition, we cooperated with the Information and Education staff in the preparation of a pamphlet on sanctuaries.

The Northeast District continued to be the only district still providing a youth upland game training program. This hunt is co-sponsored by the Essex County sportsmen. This year, 20 youths took advantage of the hunt.

The Northeast District continued to operate the Division's only warmwater rearing system with 500 largemouth bass brood stock and 2,600 5 to 9-inch fish released into state waters from this hatchery which is located on the Harold Parker State Forest in Andover.

The district manager attended numerous evening meetings including 22 County League meetings, six sportsmen's club meetings, and 11 general meetings such as conservation commissions. He also provided news releases to over 35 newspapers, two radio news releases and participated in two high school career days. The District provided professional wildlife services to about 55 individuals and organizations.

Exhibits and personnel to man them were provided for National Hunting and Fishing Day at the Lowell Sportsmen's Club; Lowell Fly Tyers annual show in Pelham, New Hampshire; the Topsfield Fair in Topsfield and the Essex Agricultural Fair in Hawthorne. We also cooperated with other districts in the New England Sportsmen's Show in Boston and the Northeastern Sportsmen's Show in Boxborough.

The Kent's Island, Mill Creek and Martin Burns' tracts located in Newbury and Rowley were combined into a single management unit and dedicated as the William Forward Wildlife Management Area.

The district live trapped and moved 14 nuisance beaver, steered trappers to other nuisance beaver and provided advice on the control of many other nuisance species.

We cooperated with Field Headquarters personnel on 12 Federally-aided research and/or management projects; e.g., woodcock census, waterfowl inventory flights, deer checking stations, and so forth.

The district manager reviewed numerous resource impact plans and statements; e.g., Section 404 of the Federal Water Pollution Act, Environmental Monitor, and wrote statements on many of them. Very close cooperation with the U. S. Fish and Wildlife Service was maintained on Section 404 permit applications.

Improvements to facilities included installation of a new gas tank and a new septic system and paving of front driveways, all at the district headquarters in Acton.

The district cooperated with the Division of Marine Fisheries in maintaining existing fishways on the Merrimack and Charles Rivers.

We also joined with planning personnel in making application to the Corps of Engineers for a management agreement for lands acquired along the Charles River for natural valley flood storage.

The district cooperated with the U. S. Fish and Wildlife Service and the Corps of Engineers in their preliminary study of the Neponset River and with the U. S. Fish and Wildlife Service in preparation of their endangered areas study.

Southeast District

Louis S. Hambly, Jr.
District Wildlife Manager

Throughout 1977-1978, the staff of the Southeast District continued traditional management and habitat improvement programs and gathered data for a variety of fish and wildlife research projects. Among these were the stocking of 146,500 trout. During the fall of 1977, 4,166 cock pheasants were stocked as preseason and in-season stockings. An additional 6,182 cock pheasants were stocked on wildlife management areas at that time along with 2,765 quail. During the spring of 1978, 115 cock pheasants and 1,000 hens were released in open covers of good pheasant habitat. One hundred seventy-eight white hare were stocked in open covers and wildlife management areas during January and February.

Routine maintenance was practiced on all wildlife management areas. This included planting 20 acres of annual grains, 15 acres of herbaceous cover, top dressing 55 acres of perennial herbaceous cover and planting of over 2,100 shrubs and herbs at Myles Standish State Forest Wildlife Management Area. Division personnel maintained ten miles of trails on five management areas and provided repairs and improvements on parking areas at six wildlife management areas. A parking area was created at the newly-dedicated Hockomock Wildlife Management Area.

Four management areas required repairs of gates and/or fences while signs were erected at seven areas. Division personnel thinned trees and brush on two management areas, applied herbicides to maintain wildlife clearings and trails at Freetown Wildlife Management Area and planned a timber harvest at Rocky Gutter Wildlife Management Area. Maintenance of buildings and structures during this period involved repairs to two buildings on the Crane Wildlife Management Area, destruction and cleanup of a building on the Hockomock Wildlife Management Area, and adjustments and repairs to the dam at West Meadows Wildlife Management Area. This area was fortunate to have the services of a YACC crew which cleared a half-acre forest area, cleared stream banks of brush and debris and undertook cuttings to improve stands of timber.

Other activities on the management areas included setting up the Crane area for field trials, a horse show and group camping as well as participation in a program to assist in acquisition of other lands for wildlife.

In the course of aiding other sections of this agency and other agencies in research projects, biologists from the Southeast District constructed, maintained and checked wood duck nesting boxes. New boxes were built and installed at four management areas. Nesting boxes for bluebirds were erected and maintained at two wildlife management areas. Assisting in another Division study, district personnel collected duck gizzards for a study on the amounts and effects of lead ingested by waterfowl. Additional research on waterfowl is carried out by the U. S. Fish and Wildlife Service and district personnel aided their data

gathering process by capturing and banding a total of 604 ducks along the coast line. More local research involved personnel in running three routes to take a census of woodcock and 16 routes to take a census of quail.

Staff of the fisheries section was heavily involved in conducting an analysis of water chemistry in selected trout ponds to determine the ponds' potential for supporting trout. Periodic checks of pH were carried out on various ponds within the district and 120 tons of agricultural lime was spread over two great ponds with a history of severe pH problems during the spring. Viable smelt eggs were stocked into two reclaimed trout ponds to provide a self-sustaining forage population.

Both adults and viable eggs of American shad were stocked into the Taunton River system to re-establish the historic shad run in that watershed. Smallmouth bass, taken from closed waters. were transferred to formerly reclaimed trout ponds containing suitable habitat for smallmouth bass in an effort to provide biological control of less desirable fish species. A program of monitoring walleye pike at Assawompsett Pond was initiated.

Fisheries personnel assisted in Division research efforts on tire reefs at Great Herring Pond, Plymouth, on the enhancement of conditions for sea-run brown trout and on the survey of fish populations in closed waters.

Technical assistance was provided to the general public in many forms as personnel from the Southeast District investigated fish kills, operated five deer checking stations, two of which were biological stations, investigated a beaver complaint and tagged 106 beaver and 6 otter pelts. Specific technical assistance was also provided to sportsmen's clubs, conservation commissions, planning groups and other groups or individuals who called requesting same.

In addition to these activities, the district staff continued regular maintenance of vehicles, equipment, buildings and policed Division properties.

COMMONWEALTH of MASSACHUSETTS
DIVISION of FISHERIES & WILDLIFE

INFORMATION & EDUCATION

Eleanor C. Horwitz
Chief of Information and Education

The Information and Education Section continues to receive a large volume of mail, averaging 40 letters per day, or over 10,000 letters per year. Most of these letters are requests for some form of information. The bulk of them can be answered with a map or a brochure but there are many that require an individual answer. Responding to such queries is probably the Section's most time-consuming function.

In order to answer such inquiries and to keep sportsmen throughout the Commonwealth informed about the latest regulations and opportunities, the Section prepares and maintains a supply of regular publications including abstracts of regulations, abstracts of special regulations for migratory birds, the annual report, an abstract of the Commonwealth's Fox-Bartley (gun) law, a list of waters stocked with trout, a list of wildlife management areas stocked with pheasant, and maps for 200 popular fishing ponds and 44 wildlife management areas, and a fishing guide to Massachusetts waters.

In addition to answering direct queries, the Section maintains a constant flow of information to radio, television and the press by issuing press releases on items of interest. During 1977-1978, the Section issued 12 press packages comprising 85 releases. These releases dealt with regulations, season openings and closings, unusual events, publications of interest and public hearings. "Tips to Writers" were not issued during this year.

The Section's major publication, MASSACHUSETTS WILDLIFE, was issued six times during the year. Subscription circulation has grown and is in excess of 30,000. Consideration was given to using the center spread pages as such and to increasing the size from 24 to 32 pages.

Other publications issued by the Division during 1977-1978 were "Quabbin Area, A Sportsman's Guide", a 20-page booklet dealing with opportunities and restrictions, as well as history, of the Quabbin area. Two flyers on wood ducks and wood duck housing were developed for distribution at the Division's exhibit which featured cavity nesting ducks of Massachusetts. Also developed for the exhibitions was a flyer introducing the Division and describing Division operations. These materials were distributed at four major shows: Eastern State Exposition in Springfield, Western Sportsmen's Show, Springfield; New England Sportsman's Show, Boston; and the Eastern Outdoor Exposition in Boxboro. All of these exhibits hosted the Division's display on cavity nesters which included a pool with live birds, a mounted photographic exhibit, and a slide projection "tour of Massachusetts' wildlife." In addition to the four major shows, the Division participated in a number of small shows, field days, and so forth sponsored by sportsmen's or other resource-based groups. Among these were Earth Day, Topsfield Fair, and National Hunting and Fishing Day activities.

For the past 14 years, the Division has sponsored the Massachusetts Sport Fishing Awards Program in cooperation with the Department of Commerce and Development. Under this program, bronze pins are given for qualifying entries in 17 categories and top prizes consisting of gold pins and plaques are awarded to the anglers with the largest fish in each category. The presentation is made at the New England Sportsman's Show.

The Section also continued its sponsorship of the competition for the migratory bird hunting stamp. In 1977 competition, top honors were awarded to William Tyner for his rendition of A. Elmer Crowell's preening black duck. Honorable mention was awarded to Rany Julius of East Bridgewater, Massachusetts and Eileen Buzzanco of Mt. Kisco, New York.

There was some consideration of holding a competition for artwork to be used on the archery stamp, but this idea was again rejected in favor of commissioning an artist to provide a design. Artwork for the 1977 stamp was provided by artist Russ Buzzell.

The Audio-Visual Aids staff continued to work on the production of two feature-length films--one on the Commonwealth's wildlife and one on Division activities. They also continued to utilize all possible photo opportunities increasing the Division's file of both black and white and color photographs. Many of these were used for Division exhibits and publications while over 150 were sent to newspapers and free-lance writers requesting same. Film footage was provided for the Massachusetts Audubon-Massachusetts Division of Fisheries and Wildlife film project and for use on a variety of television shows including Channel 5's Bill O'Connell show and Channel 27's Jack Woolner Show.

Other Section activities during the 1977-1978 period include revising and updating the mailing lists for press releases and petitioning for a special educations rate permit which would allow the Division to mail bulk material at a greatly reduced rate (petition approved); preparation and distribution of two radio "spot" announcements, one in the fall dealing with fall fishing opportunities in the Commonwealth, the other in the spring dealing with problems caused by people picking up young wild

animals; coordination of a conference which brought together the Division of Fisheries and Wildlife and the Division of Law Enforcement for a discussion of problems and opportunities faced by both agencies. Representative Richard Dwinell and Commissioner Bruce Gullion addressed the groups as guest speakers. Other sessions were chaired by members of both Divisions. The Section also coordinated efforts leading to the dedication of the newly-purchased Hockomock Swamp area as the Hockomock Swamp Wildlife Management Area and the turkey farm situated thereon as the Erwin S. Wilder Wildlife Management Area.

As in the past years, the Division continued to play an active role in the administration and operation of the Massachusetts Junior Conservation Camp sponsored by the Division, the Massachusetts Department of Environmental Affairs and the Fund for the Preservation of Wildlife and Natural Areas. Camperships were solicited, campers were enrolled and Division personnel led sessions in wildlife management, fishery management, and pond and stream ecology. At the conclusion of the two-week session, the Division, through the Information and Education Section, administered an examination and subsequently participated in the successful graduation of 146 campers. Also, as in the past years, Section personnel continued to provide films and talks to school and civic groups--this year numbering 50 and including such diverse groups as 4-H groups, Cub Scout "fathers' night", Trout Unlimited, YACC groups, The Wildlife Society (University of Massachusetts Chapter), and the Trailside Museum.

This year, in addition to educating youngsters, attempts were made to reach adults in a more formalized way. Preliminary work was initiated toward establishing an adult education program relating wildlife use to the use of other natural resources. A volunteer group of sportsmen educators met on six occasions, participated in field trips and developed a series of ten lesson-outlines which can serve as a guide in setting up an extension level or adult education course. Through the group's efforts, a grant was made available that will cover student materials when the program goes into effect. Work is proceeding on this project.

Realty

COMMONWEALTH of MASSACHUSETTS
DIVISION of FISHERIES & WILDLIFE

Floyd Richardson
Chief of Wildlife Lands

Introduction

Recreational demands on publicly-owned lands increase with each succeeding year. Loss of open space continues at an alarming rate. The ravenous appetite of the developer places serious demands on vacant land. This demand breeds competition which results in skyrocketing land values. Lands classified as junk land a few years ago are now considered prime building lots.

Unfortunately, lands lost to development are lands lost forever. Efforts by this Division to reserve lands through acquisition in no way stem the tide. There is some solace, however, in knowing that these lands will provide unlimited recreational opportunities and will not be lost. The expenditure of one and one-half million dollars for hunting and fishing lands during this fiscal year typifies this agency's concern. Three thousand seven hundred and forty-five (3,745) additional acres are now in the public domain.

Hockomock Acquisition Project

To further complement this distinctive and unique area, two parcels of five hundred forty-five (545) acres in total were acquired and became part of a complex known as the Hockomock Swamp. One hundred twenty (120) acres were acquired in the Town of West Bridgewater. These consist of mixed woodlands and marshlands and provide a connecting link with other Division-owned areas. This parcel provides 1500 feet of road frontage and 1200 feet of stream bank on the Town River. Another tract, consisting of 425 acres, situated in the Town of Norton and the City of Taunton was also a valuable addition. The area acquired was once a flourishing turkey farm. Numerous range fields, hay covered and interspersed with shrub growth, provide ideal habitat for farm game. Acceptable management practices will metamorphose this erstwhile turkey range into a wildlife management unit second to none, fulfilling a definite need in this region of the Commonwealth.

Rocky Gutter Acquisition Project

Seven acquisitions, totaling 1158 acres in the Town of Middleboro, significantly enlarge this versatile wildlife management area. Rocky Gutter presently boasts an area nearly 3000 acres in size. The lands acquired were of extreme importance as they were concentrated in the proximity of Rocky Gutter Street. This effectively prevents development and extinguishes the threat of residences being constructed in the heart of the area.

Peru Acquisition Project

The Peru Wildlife Management Area is located in central Berkshire County approximately 20 miles east of the City of Pittsfield. Rolling hills, typical of this region, covered by mixed forests and fields of wild blueberry, valleys with occasional beaver ponds and marshes fed by small, clear trout streams, grace this area and lend a rural wildlife atmosphere. This area has been in Division ownership for over 20 years.

A section of 113 acres of property abutting Division-owned land and with considerable frontage on Route 143 and Mongue Road was acquired. The new addition increases the size of this popular management area to 2638 acres.

Squannacook River Acquisition Project

A small cart path which acted as a right-of-way was seriously threatened by plans to construct homes on either side. The configuration of the winding cart path would eventually create problems for owners of these homes and would jeoparize sportsman-landowner relations. This potential problem was eliminated by the purchase of the two building lots containing 3.37 acres in total. Unimpeded access is guaranteed by this acquisition.

Windsor Acquisition Project

This area, located in the Berkshire hill town of Windsor, and named in the memory of the late Eugene D. Moran, is gaining popularity with sportsmen. Two hundred twenty-seven (227) additional acres were acquired enlarging the area to 1,022 acres. The acquired property, once farmland, contributes prime wildlife lands, additional access and protection from residential development.

Bolton Flats Acquisition Project

Efforts to enlarge this excellent wildlife area were rewarded by three acquisitions in the towns of Bolton and Lancaster. One hundred eighty-one (181) acres of prime farmland having considerable frontage on Route 117 and Route 110 make an invaluable contribution. Access, parking and uninterrupted land control are but a few of the benefits provided by the new addition. Bolton Flats, long recognized as a unique and exceptional wildlife area, has steadily grown since the initial acquisition of the former Hy-Crest Farm. Sportsmen are now the benefactors of nearly 900 acres.

Hinsdale Flats Acquisition Project

The perimeters of this wildlife unit were extended with the acquisition of 409 acres. Four separate property transactions yielded farmlands, marshes and woodlands. An additional 1800 feet of road frontage was gained along the Skyline Trail and the Division acquired increased control along the banks of the Housatonic River. These properties appreciably augment this comparatively new wildlife management area, bringing it to 1000 acres.

Birch Hill Acquisition Project

One thousand ninety-one (1091) acres of attractive hunting and fishing lands were added to the Birch Hill Wildlife Management Area in the towns of Royalston and Winchendon. Two hundred (200) acres came to this agency as a gift with the remaining 891 acres being acquired by purchase. These lands further insure the sportsmen of today and tomorrow an area where they can pursue their sport without the threat of eviction.

Quaboag River Acquisition Project

One of the major objectives of our acquisition program has been stream bank ownership. Public ownership eliminates the problems and aggravations encountered by the general public when trespassing on privately-owned stream-side properties. A Quaboag River acquisition project was initiated to place in public domain lands adjacent to this valuable resource. Additionally, it would provide a connecting corridor with the wildlife management area of the same name. Two parcels were acquired in the Town of Brookfield. The Ludlow Corporation donated a five and one-half (5.5) acre parcel situated on the north bank of the river and adjacent to Route 148. The second acquired parcel, containing 16.5 acres, is located on Long Hill Road and contributes additional road and stream frontage.

Gosnold Acquisition Project

The General Services Administration of the United States of America transferred the ownership of a parcel of land on Naushon Island in the Town of Gosnold to our agency at no cost. The property, consisting of 4.35 acres, was obtained by the United States government in the year 1817 to establish a lighthouse station and has been in government ownership ever since. The property is located on the easterly side of Naushon Island in an area commonly known as Tarpaulin Cove. The premises were conveyed as a reserve for the conservation of wildlife.

Leased Fishing Waters

Our leasing program entered its forty-fifth year during this fiscal period. Although the number of leased properties have diminished over the years, eight miles of river frontage are still available to fishermen. Renewal leases which will not expire until 1983 offer fishing privileges on the East and Middle Branch of the Westfield River in the towns of Cummington, Chesterfield, Middlefield and Worthington and on the Clam River in Sandisfield.

COMMONWEALTH of MASSACHUSETTS • DIVISION of FISHERIES & WILDLIFE •

Engineering

John Sheppard
Conservation Engineer

Field Headquarters, Westboro

Exterior development of the Field Headquarters included the recently completed construction of a 3,000 square foot storage and workshop complex. This facility should help alleviate the currently congested storage problems at this installation.

Also completed during Fiscal 1978 at the Field Headquarters was a 10,000 square foot employees' parking area and a new 4,000-gallon capacity fuel storage system.

Interior development at this complex included a new fisheries laboratory and a wildlife laboratory. These labs were badly needed to enhance and update the Division's research facilities.

Hatcheries

Construction of the new hatch house at the Sandwich hatchery has been completed. Development at this complex also included a new pump for the hatch house and the redevelopment of an existing well. A new heating system was installed in the old hatch house.

A new water supply system, vertical turbine pumping system and sump tank were constructed as part of the new water treatment unit at the Palmer Experimental Salmon Station. Also, storm windows were installed on the existing hatch house.

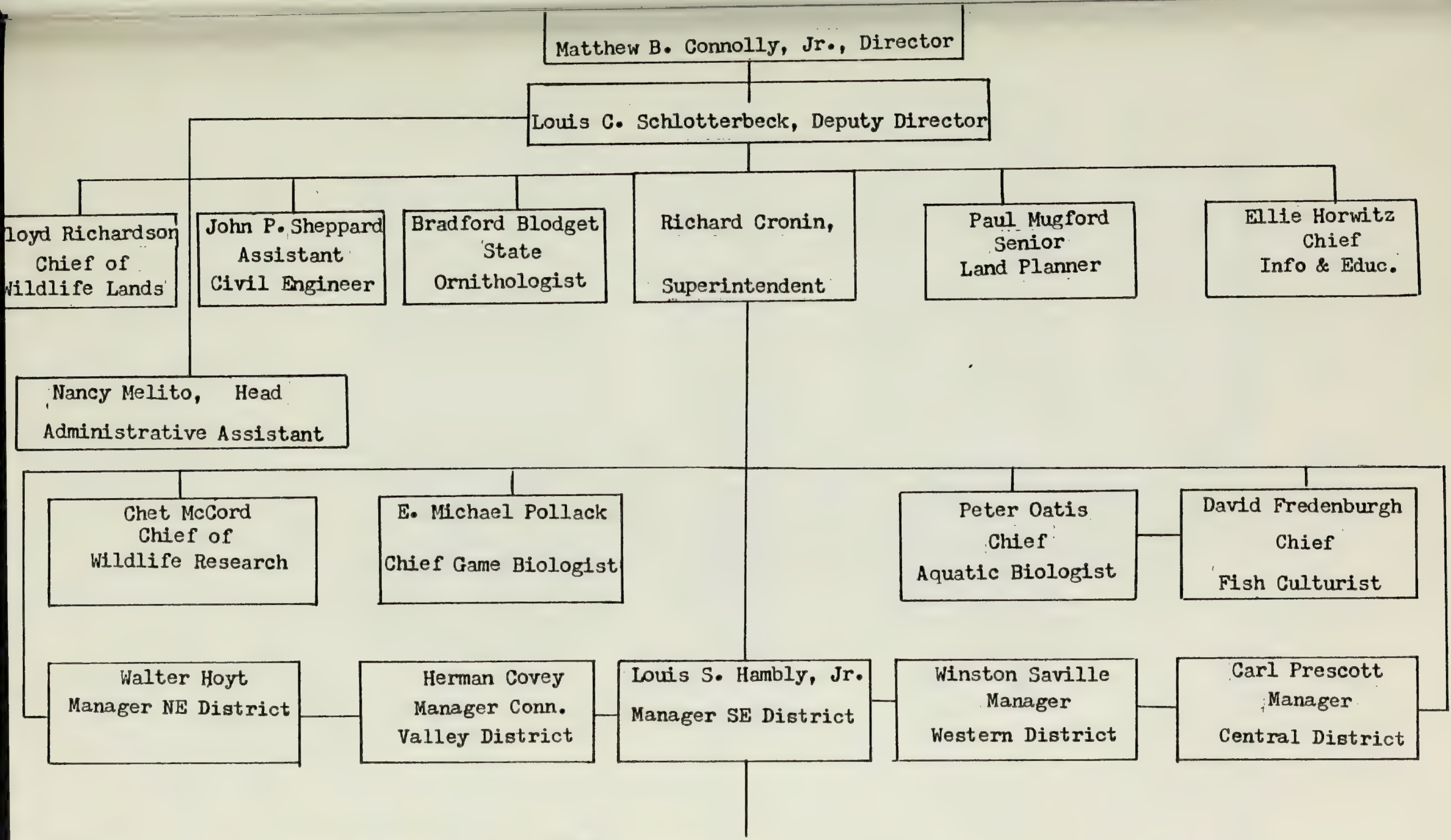
New protective security fencing was installed at the McLaughlin Trout Hatchery.

Districts

A new district headquarters building was constructed at the Connecticut Valley District in Belchertown. This building is a 4,000-square foot complex incorporating offices, workshop and garage areas.

A fuel storage system and new septic system were upgraded at the Northeast District headquarters complex in Acton and a new gas pump was installed at our Southeast District headquarters facility at Buzzards Bay.

In the Central District, we completed the paving of ramp and parking areas at the headquarters building in West Boylston and gravel parking areas were constructed at the Bolton Flats, Winimusset and Four Chimneys wildlife management areas.


Matthew B. Connolly, Jr., Director
Louis C. Schlotterbeck, Deputy Director
loyd Richardson
Chief of
ildlife Lands
John P. Sheppard
Assistant
Civil Engineer
Bradford Blodget
State
Ornithologist
Richard Cronin,
Superintendent
Paul Mugford
Senior
Land Planner
Ellie Horwitz
Chief
Info & Educ.
Nancy Melito, Head
Administrative Assistant
Chet McCord
Chief of
Wildlife Research
E. Michael Pollack
Chief Game Biologist
Peter Oatis
Chief
Aquatic Biologist
David Fredenburgh
Chief
Fish Culturist
Walter Hoyt
Manager NE District
Herman Covey
Manager Conn.
Valley District
Louis S. Hambly, Jr.
Manager SE District
Winston Saville
Manager
Western District
Carl Prescott
Manager
Central District

Organizational Chart

DIVISION OF FISHERIES AND WILDLIFE

PERSONNEL

Personnel changes during Fiscal 1978 were:

Retirements

Thomas McMahon, Conservation Skilled Helper, 30 July 1977

Appointments

Bradford Blodget, State Ornithologist, 5 July 1977
William Hearn, Conservation Helper, 6 September 1977
Richard Solomon, Conservation Helper, 6 September 1977
Philip Warren, Conservation Helper, 14 November 1977
Eleanor Mitchell, Principal Clerk, 14 August 1977
Cynthia Hatch, Junior Clerk and Stenographer, 17 January 1978
Nancy Williams, Junior Clerk and Typist, 30 April 1978
Michael Syslo, Conservation Helper, 8 May 1978
Howard Krieser, Conservation Helper, 18 June 1978

Promotions

Roscoe Bicknell, Conservation Skilled Helper, 9 October 1977
David Ford, Conservation Skilled Helper, 27 November 1977
Robert Madore, Aquatic Biologist, 11 December 1977
William Humberstone, Conservation Skilled Helper, 29 January 1978
John Boudreau, Game Bird Culturist, 19 February 1978

Resignations

Joseph Comick, Conservation Helper, 30 July 1977
Paul Matulis, Conservation Helper, 15 August 1977
Philip Breen, Conservation Helper, 20 August 1977
Stephen Rideout, Aquatic Biologist, 27 August 1977
Susan Shwom, Junior Clerk and Typist, 31 August 1977
Gary Simpson, Conservation Helper, 1 October 1977
Dianne Ferragamo, Junior Clerk and Typist, 19 November 1977
Robert Schleyer, Conservation Skilled Helper, 25 February 1978
Maria Lena, Junior Clerk and Typist, 1 April 1978
Philip Warren, Conservation Helper, 20 May 1978

LEGISLATION

The following is a compilation of titles of bills affecting wildlife or of particular interest to the Division of Fisheries and Wildlife which were enacted during the fiscal period 1977-1978.

Chapter 113 - An act further regulating the issuance of sporting, hunting, fishing and trapping licenses. Effective 27 July 1978.

Chapter 276 - An act relative to the loss of licenses for certain fish and game violations. Effective 21 September 1978.

Chapter 387 - An act providing for the noncriminal disposition of certain fish and game and marine fishery violations. Effective 10 October 1978.

Chapter 453 - An act making certain corrective changes relative to the law authorizing the Commissioner of Fisheries, Wildlife and Recreational Vehicles to convey certain land in Georgetown to Joanne C. Stanley and to convey other land to William E. Handren in exchange for certain land. Effective 17 July 1978.

Chapter 473 - An act relative to permits issued for certain aquacultural purposes. Effective 15 October 1978.

Chapter 505 - An act transferring control of certain land at Gardner State Hospital to the Executive Office of Environmental Affairs. Effective 17 October 1978.

Chapter 506 - An act authorizing the Commonwealth to take four certain tracts of land in the towns of Spencer and Leicester. Effective 2 August 1978.

The 1977 legislative session ran into 1978 with the result that Commonwealth business was not concluded until January 1978 and late-passed legislation could not be included in the Annual Report for Fiscal Year 1977. Thus these bills, although they are legitimately part of the previous year's annual report, are included here.

Chapter 387 - An act authorizing and directing the Department of Fisheries, Wildlife and Recreational Vehicles to convey a certain parcel of land and to grant an easement over a certain parcel of land to the Town of Lenox for sewerage purposes. Effective 11 July 1977.

Chapter 542 - An act further regulating license requirements for falconers and the sport of falconry. Effective 22 December 1977.

Chapter 593 - An act increasing the penalties for certain violations of law relative to ferrets and fitchews. Effective 1 July 1978.

Chapter 679 - An act prohibiting the use of certain animals as lures or bait. Effective 23 January 1978.

Chapter 881 - An act directing the Commissioner of Fisheries, Wildlife and Recreational Vehicles to convey certain land in Georgetown to Joanne C. Stanley and to convey other land to William E. Handren in exchange for certain land. Effective 30 December 1977.

Chapter 921 - An act further regulating field trials under the control of the Division of Fisheries and Wildlife. Effective 3 April 1978.

Chapter 971 - An act relative to the commercial harvest of eels in the waters of the Commonwealth. Effective 11 April 1978.

Chapter 983 - An act reducing the fee for hunting and fishing licenses for certain persons over sixty-five years of age. Effective 1 January 1979.

FINANCIAL REPORT

Nancy Melito
Head Administrative Assistant

The Division of Fisheries and Wildlife is funded, by and large, through the sale of fishing, hunting, trapping and other special licenses. Additional income is realized through Federal Aid reimbursement, other miscellaneous sales, income and donations. Operating monies are appropriated on a fiscal year basis from the Inland Fish and Game Fund through enactment by the Legislature after consideration of the Division's budget request. The following report is the record of actual expenditures and income for the fiscal year 1978.

In the first section entitled "How the Sportsmen's Dollar Was Spent", in general, increases in expenditures were the result of normal salary increments and the prevalent inflationary factor. Land acquisition decreased 26 percent or $1,885,700 from the previous fiscal year as the Division neared the end of expenditure of the original $5,000,000 bond issue for this specific purpose.

The third section, "A Summary of Fish and Wildlife Income" shows a decrease of 43 percent or $6,450 less than the 1977 fiscal period in antlerless deer application receipts. This occurred because of a change in Division procedure, but the resultant cutback in clerical time involved in processing same, more than compensates for the dollar decrease. A significant decrease of approximately 18 percent or $59,797 less than the 1977 fiscal year occurred in Federal Aid reimbursement. Considerable monies anticipated, particularly in the area of land acquisition, were not realized because of additional procedural requirements imposed by the Federal government. However, it is felt that these monies will be received in the new fiscal year.

Detail Sheet No. 1 which is an analysis of fishing, hunting and sporting license and stamp sales indicates, as is usual from year to year, fluctuations in the various categories. Perhaps not notably, but interestingly enough, 25,135 waterfowl stamps were issued in 1977; 25,134 in 1978.

The ultimate result of operation in the 1978 fiscal year shows a deficit in the Inland Fish and Game Fund of $292,414.70 which the Division hopes to resolve mainly through cutbacks in expenditures, stepped-up efforts to realize more Federal Aid monies, an increase in user fees and legislation to increase the share of the fuel tax.

COMMONWEALTH OF MASSACHUSETTS
DIVISION OF FISHERIES AND WILDLIFE
General Administration
Fiscal Year July 1, 1977 to June 30, 1978
"HOW THE SPORTSMEN"S DOLLAR WAS SPENT"

ADMINISTRATION				
Administration	2310-0200	322,524.05		
Board of Fisheries and Wildlife	2310-0200	0.	324,524.05	6.80%
Information-Education	2310-0200	....	196,361.66	4.12%
FISHERIES PROGRAMS				
Fish Hatcheries	2310-0600	....	601,840.70	12.62%
**Fisheries Management	2310-0600	413,525.29		
Fisheries Cooperative Unit	2310-0600	15,000.00	428,525.29	8.99%
WILDLIFE MANAGEMENT				
Game Farms	2310-0400		459,879.83	9.64%
**Wildlife Management	2310-0400	470,837.18		
Wildlife Cooperative Unit	2310-0400	15,000.00		
Damage by Wild Deer & Moose	2310-0800	13,964.70	499,801.88	10.49%
LAND ACQUISITION				
***Acquisition of Upland Areas and Inholding on Existing Areas	2310-0310	179,099.66		
***Coastal and Inland Waters Acquisition	2670-9016	509,927.59	689,027.25	14.44%
ENGINEERING AND CONSTRUCTION				
*Development and Improvement of Facilities for Public Use	2310-0300	356,687.69		
*Renovation of Lyman School	2670-8753	—		
*Pollution Abatement (McLaughlin)	2670-9021	5,282.09		
*Fish Screens (Quabbin Reservoir)	2670-9022	—		
*Fish Rearing Facilities (Palmer and McLaughlin)	2670-9023		361,969.78	7.59%
SECRETARY, ENVIRONMENTAL AFFAIRS				
Office of Secretary (3%)	2000-0100	....	5,865,77	.11%
DEPARTMENT OF FISHERIES, WILDLIFE AND RECREATIONAL VEHICLES				
Commissioner's Office (50%)	2310-0100	....	34,874.03	.73%
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT				
Natural Resources Officers' Salaries and Expenses (30%)	2020-0100	....	355,058.09	7.44%
Hunter Safety Training (100%)	2020-0300	....	58,426.30	1.22%
TRANSFERS FROM FUNDS				
Group Insurance	1590-1007	....	182,515.66	3.83%
Settlement of Certain Claims		....	101.90	.01%
RETIREMENT ASSESSMENT (.2%)	0612-1000	....	178,449.78	3.74%
INTEREST ON BONDED DEBT	0699-2800	....	77,845.00	1.63%
MATURING SERIAL BONDS AND NOTES	0699-2900	....	315,000.00	6.60%
			4,770,066.97	100.00%

*Continuing Appropriation

**Portions of expenditures 60% or 75% reimbursable by Federal Government

**Certain Land Acquisitions are 50% reimbursable by Federal Government

COMMONWEALTH OF MASSACHUSETTS
DIVISION OF FISHERIES AND WILDLIFE

APPROPRIATIONS AND EXPENDITURES
Fiscal Year July 1, 1977 to June 30, 1978

ACCOUNT NO.	TITLE	APPROPRIATIONS	EXPENDITURES & LIABILITIES	TOTAL REVERSION
2310-0200	Administration	527,942.00	518,885.71	9,056.29
2310-0400*	Wildlife Management	952,547.00	945,717.01	6,829.99
2310-0600*	Fisheries Management	1,138,041.00	1,030,365.99	107,675.01
2310-0800	Damage by Wild Deer & Moose	13,988.00	13,964.70	23.30
		2,632,518.00	2,508,933.41	123,584.59

		CONTINUING APPROPRIATIONS	EXPENDITURES	BALANCE FORWARD
2310-0300	Development & Improvement Facilities for Public Use	549,045.87	356,687.69	192,358.18
2310-0310**	Acquisition of Upland Areas & Inholding on Existing Areas	379,733.00	179,099.66	200,633.34
2670-8753	Certain Renovations to Lyman School Building	36.39	-	36.39
2670-9016**	Acquisition of Coastal & Inland Wetlands	724,630.16	510,084.37	214,545.79
2670-9021	Pollution Abatement: McLaughlin Hatchery	66,104.65	5,282.09	60,822.56
2670-9022	Fish Sereens: Quabbin Reservoir	4,105.37	-	4,105.37
2670-9023	McLaughlin & Palmer Hatcheries	4.51	-	4.51
		1,723,659.95	1,051,153.81	672,506.14

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* Portions of expenditures 60% or 75% reimburseable by Federal Government

* Certain Land Acquisitions are 50% reimburseable by Federal Government

SUMMARY OF FISH AND WILDLIFE INCOME

July 1, 1977 to June 30, 1978

*Fishing, Hunting and Trapping Licenses	3304-61-01-40	$2,277,993.30
**Trap Registrations	" " " "	1,301.00
*Archery Stamps	" " " "	39,659.20
**Special Licenses, Tags and Posters		9,739.25
*Waterfowl Stamps	3304-40-01-40	5,614.15
*Waterfowl Stamps - Ducks Unlimited	3304-40-02-40	20,177.60
Antlerless Deer Permits	3304-61-14-40	8,571.50
Bear Permits	" " " "	220.50
Rents	3304-63-01-40	11,915.24
Miscellaneous Income	3304-69-99-40	838.32
Sales, Other	3304-64-99-40	6,761.85
Refunds Prior Year	3304-69-01-40	984.48
Court Fines and Penalties	3308-41-01-40	12,372.50
Pittman-Robertson Federal Aid	3304-67-01-40	190,885.58
Dingill-Johnson Federal Aid	3304-67-02-40	84,177.21
Anadromous Fish Projects Federal Aid	3304-67-04-40	23,723.63
Reimbursement for Services	3304-62-01-40	4,937.00
Interest on Investments	3395-60-01-40	51,799.50
Gasoline Tax Apportionment	3312-05-01-40	305.579.72
Transferred From Other Funds		18,403.20
		3,079,654.73

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Deficit in Inland Fish and Game Fund as of June 30, 1978: 292,414.70

*Detail Sheet No. 1

**Detail Sheet No. 2

DIVISION OF FISHERIES AND WILDLIFE
RECEIPTS FROM FISHING, HUNTING AND TRAPPING LICENSES
Fiscal Year July 1977 to June 30, 1978

Type Of License	Price	Quantity	Gross Amount	Fees Retained by Clerks	Not Returned to State
Series #1 Res. Cit. Fishing	8.25	119,894	989,126.05	29,786.50	959,339.55
#2 Res. Cit. Hunting	8.25	54,922	453,106.50	13,625.50	439,481.00
#3 Res. Cit. Sporting	13.50	50,901	687,163.50	12,607.50	674,556.00
#4 Res. Cit. Minor Fishing	6.25	9,275	57,968.75	2,313.25	55,655.50
#5 Res. Cit. Alien Fishing	11.25	926	10,417.50	226.50	10,191.00
#6 Non-Res. Alien Fishing and Non-Res. Cit. Fishing	14.25	3,048	43,434.00	755.25	42,678.75
#7 Non-Res. Alien & Non-Res. Cit. 7-day Fishing.	8.25	1,852	15,279.00	461.00	14,818.00
#8 Non-Res. Alien & Non Res. Cit. Small Game Hunting	20.25	801	16,220.25	185.50	16,034.75
#9 Non-Res. Alien & Non-Res. Cit. C.S.P. 3-day Small Game Hunting	16.25	43	698.75	9.75	689.00
#10 Res. Cit. Minor Trapping	6.25	445	2,781.25	111.00	2,670.25
#11 Res. Cit. Trapping	11.50	1,092	12,558.00	269.25	12,288.75
#12 Duplicates	1.00	3,636	3,636.00	—	3,636.00
#13 Res. Alien Hunting	16.25	1,100	17,875.00	88.75	17,786.25
#14 Non-Res. Alien & Non-Res. Cit. Big Game Hunting	35.25	803	28,305.75	197.25	28,108.50
#15 Res. Cit. Sporting (over 70)	FREE	18,700			
#16 Res. Cit. Fishing (Blind, Paraplegic, Mentally Retarded)	FREE	1,051			
#17 Res. Cit. Hunting (Paraplegic)	FREE	75			
		268,564	2,338,570.30	60,637.00	2,277,933.30
#18 Archery Stamps	5.10	7,931	40,448.10	788.90	39,659.20
		276,495	2,379,018.40	61,425.90	2,317,592.50
#19 Waterfowl Stamps	1.25	25,134	31,417.50	5,625.75	25,791.75
		301,629	2,410,435.90	67,051.65	2,343,384.25

SPECIAL LICENSES, TAGS AND POSTERS

Receipt Acct.	Type of License	Quantity & Unit Price	Amount
3304-61-02-40	Fur Buyers		
	Resident Citizens:	32 @ 15.00	480.00
	Non-Residents or Alien:	3 @ 50.00	150.00
3304-61-03-40	Taxidermists:	120 @ 10.00	1,200.00
3304-61-04-40	Propagators		
	Special Purpose Permits:	128 @ 1.00	128.00
	Class 1 (Fish)		
	Initial:	13 @ 7.50	97.50
	Renewal:	139 @ 5.00	695.00
	Class 3 (Fish)		
	Initial:	4 @ 7.50	30.00
	Renewal:	64 @ 5.00	320.00
	Class 4 (Birds & Mammals)		
	Initial:	91 @ 7.50	682.50
	Renewal:	414 @ 5.00	2,070.00
	Duplicate:	1 @ 4.25	4.25
	Class 6 (Dealers)	1 @ 1.00	1.00
	Initial:	4 @ 7.50	30.00
	Renewal:	48 @ 5.00	240.00
	Additional:	443 @ 1.50	664.50
	Class 7 (Individual Bird or Animal)		
	Initial:	12 @ 3.00	36.00
	Renewal:	44 @ 1.00	44.00
	Importation Permits:	33 @ 5.00	165.00
	Class 9 (Falconry)		
	Masters:	5 @ 25.00	125.00
	Apprentices:	9 @ 25.00	225.00
	General:	4 @ 25.00	100.00
	Class 10		
	Raptor Breeding:	4 @ 10.00	40.00
	Raptor Salvage:	3 @ 1.00	3.00
3304-61-05-40	Take Shiners	111 @ 5.00	555.00
	Duplicate:	1 @ 1.00	1.00
3304-61-06-40	Field Trial Licenses:	4 @ 15.00	60.00
3304-61-08-40	Initial:	10 @ 7.50	75.00
	Renewal:	34 @ 5.00	170.00
3304-61-10-40	Commercial Shooting Preserves:	8 @ 50.00	400.00
3304-61-12-40	Mounting Permits:	13 @ 2.00	26.00
3304-61-13-40	Special Field Trial Permits:	35 @ 15.00	525.00
3304-64-01-40	Game Tags:	7,790 @ .05	389.50
	Fish Tags:	350 @ .02	7.00
			$9,739.25
304-61-40	Trap Registrations:		
	Initial:	283 @ 2.00	566.00
	Renewal:	490 @ 1.50	735.00
			$1,301.00

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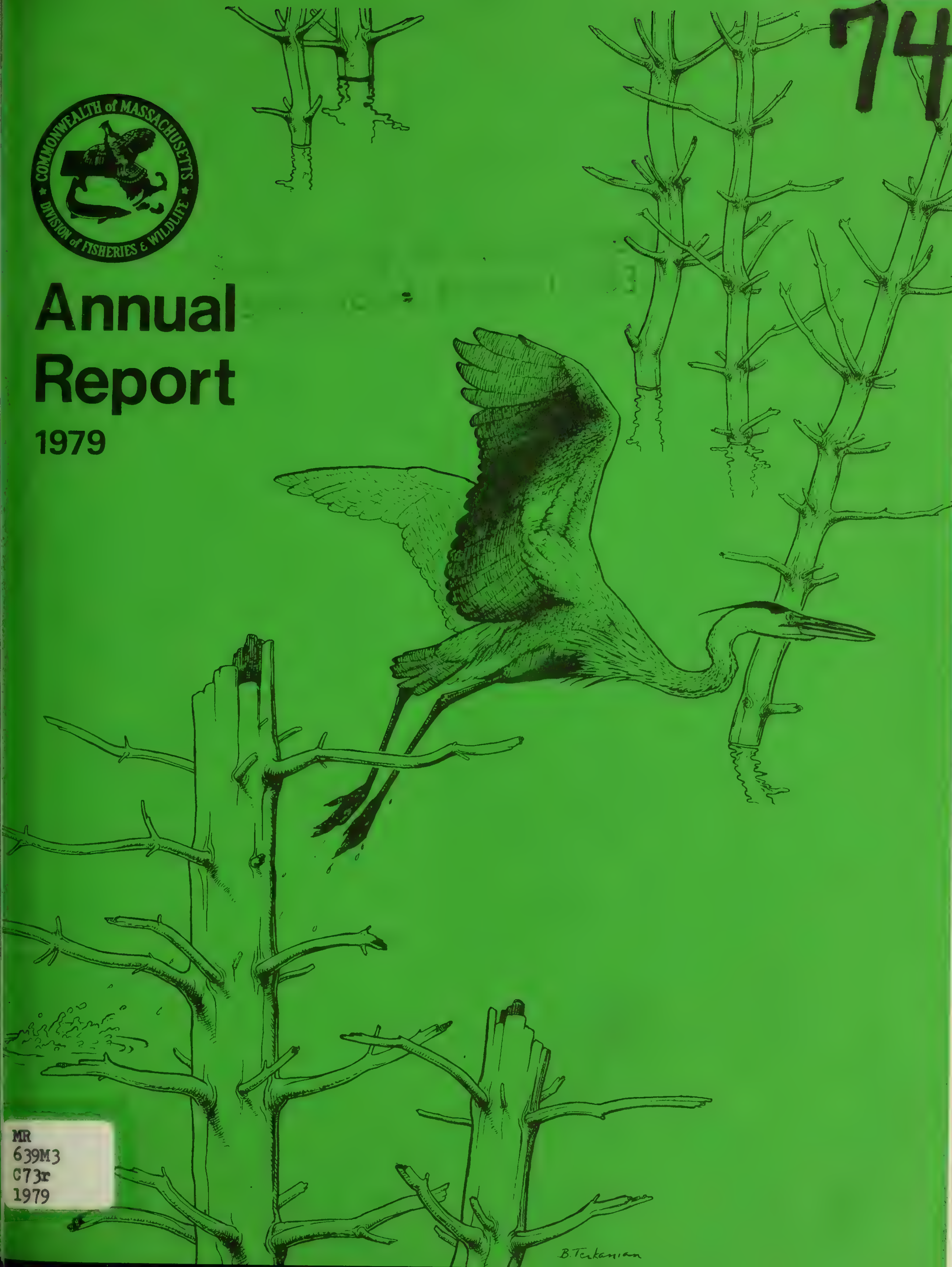
COMMONWEALTH of MASSACHUSETTS
DIVISION of FISHERIES & WILDLIFE

Annual Report

1979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The Commonwealth of Massachusetts
Division of Fisheries and Wildlife
Field Headquarters, Westboro 01581

His Excellency, Edward J. King, Governor of the Commonwealth, the Executive Council, the General Court, and the Board of the Division of Fisheries and Wildlife.

Sirs:

I have the honor to submit herewith the One Hundred and Fourteenth Annual Report of the Division of Fisheries and Wildlife, covering the fiscal year from 1 July 1978 to 30 June 1979.

Respectfully submitted,
Richard Cronin
Richard Cronin
Director

Publication #11,880-53-250-4-80-CR
Approved by Alfred C. Holland, State Purchasing Agent.

MR
639/M3
C73r
1979

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The Board Reports

Bradlee E. Gage
Chairman
Fisheries and Wildlife Board

As required by law, the Administrative Board of the Division of Fisheries and Wildlife met on a monthly basis throughout the year. Following a policy set several years ago, the Board moved its meetings around the state, holding sessions in Turners Falls, Pittsfield and Belchertown, as well as its usual meeting place at the Westboro Field Headquarters.

In the Board's opinion, the Division is continuing to fulfill its role as the manager of the state's wildlife resources. There continues to be a high level of both professional competence and morale.

Personnel

In June 1979, the Board learned, with much regret, of the resignation of the Division's director, Matthew B. Connolly, Jr., who was leaving to accept a position with Ducks Unlimited, Inc. This will be a loss to both the state and the sportsmen. The Board immediately set out to search for a replacement.

There was one replacement on the Board. After many years of faithful and valuable service, Martin Burns decided not to seek reappointment. His experience and common sense will be sorely missed. The Board is fortunate in having a very qualified replacement, Nancy Begin, also from Essex County. As an agriculturist and avid sportsperson, Mrs. Begin is a most welcome addition.

Hearings

A principal function of the Administrative Board is the establishment of regulation. Regulations and regulatory changes can come about only after public hearings. The Board recognizes that regulatory changes are sometimes disturbing to many sportsmen, yet, it also realizes that there are changes occurring in the state, in fish and wildlife populations, and in fishing and hunting pressures. As a result, possible regulatory changes must be considered. The hearing plays an important role as it presents the major opportunity for the Board to hear an interchange of views among the Division biologists, the sportsmen, and the general public.

Several key hearings were held during Fiscal 1979. The annual waterfowl hearings were held in August with a large turnout of duck hunters present. The controversy of early-versus-late hunting inland versus coastal hunting, and the need to make immediate decisions to comply with Federal time requirements are factors which combine to make this a complex hearing.

In May, a hearing on possible changes in the primitive weapons season ended almost a year's study and review by the Board. This culminated in June with the unanimous decision to revert to the original intent of the Board at the time when this season was initially established--to utilize the true primitive muzzle loader or replica, as well as to tighten up specific regulations regarding permissible types of shot, powder and so forth.

Other hearings dealt with establishment of a stream catch-and-release program on a very limited basis. Recognizing changing conditions and increased fishing pressures in the Commonwealth, the Board agreed to try an experimental catch-and-release program on the upper one and one-half miles of the Deerfield River.

The opening of the raccoon season was moved from September to mid-October, and then, after a subsequent hearing, was moved back to 1 October.

Division Activities

In its role as "overseer" of Division activities, the Board in conjunction with the Director and his staff, at various times during the year touched on almost all facets of Division activities. This ranged from frequent briefings on budgets, legislative bills, and general Division programs to specifics such as the hoped-for Otis Air Force Base shooting facility.

Board Concerns

Two major concerns of previous reports, unduly low pay for Division professionals and antiquated equipment, still remain. Unfortunately, from a realistic point of view, the Board can do little about changing this situation other than to offer support to the Director in his efforts to correct this. It is gratifying to see a start in the budget which has some monies set aside for the replacement of equipment.

Division revenue and inflation are serious concerns facing both the Board and the Director. Historically, the Division has paid its own way with the sportsmen's license monies as the backbone of the budget. However, inflation and outside costs are increasing Division expenses much more rapidly than revenue can increase. This is both a short-term and long-term problem. Fortunately, the Division, the Board and the sportsmen of the state recognize the problem and are moving to meet it.

A last concern is over the area of land acquisition. The state, in general, and the sportsmen, in particular, have gained from the Division's strong land acquisition program of the past 15 years. With tightening budget restraints, it appears that monies for land acquisition will be negligible.

In summary, the Board is satisfied that the Division is performing its role in state government in an exemplary manner with a high degree of professionalism. With continued cooperation of the sportmen, the legislature, and other state agencies, the Division of Fisheries and Wildlife will continue to move ahead.

Planning

Paul S. Mugford
Senior Land Use Planner

The Division's commitment to a businesslike, well-ordered planning process was confirmed in September of 1977 with the implementation of "Comprehensive Wildlife Planning." This action ties the Division to a continuous Federally-assisted program that undertakes to improve fish and wildlife management effectiveness by providing sound data and a range of alternatives upon which administrative decisions will be based. Comprehensive planning will emphasize program outputs and benefits rather than inputs and activities. It will develop a data bank of natural resource supplies, needs, and financial and manpower resources upon which management decisions will rely, as well as providing managers with evaluations of alternative strategies and costs associated with meeting program objectives.

In 1979, a team of three planners began to assist in the development of methodologies for compiling and assessing data on wildlife and wildlife habitat supplies and on resource user demands and satisfactions. Considerable existing data was assembled by biological staff and surveys initiated to obtain additional data. In late fall of 1978, and again in the spring of 1979, some 2000 telephone interviews were completed gathering additional up-to-date information on species preferences, harvests, and related data from Massachusetts-licensed anglers. All data is currently being computerized in anticipation of subsequent retrieval and analysis.

"Comprehensive Wildlife Planning" will produce two things: firstly, a strategic plan that will tell us where we want to go, and, secondly, an operational plan that will tell us how to get there. As a whole, "Comprehensive Wildlife Planning" will:

1. Encourage the agency to set measurable objectives that promote action rather than reaction.
2. Provide well-ordered sets of alternatives for decision-makers.
3. Alert other resource users to wildlife requirements.
4. Strengthen the agency's position in negotiations with other resource users.

5. Expose and examine opportunities and problems.
6. Mobilize and allocate the agency resources needed to accomplish objectives.
7. Evaluate progress toward stated objectives.
8. Eliminate piecemeal decisions.
9. Serve as the basis for all management decisions.

A third phase of "Comprehensive Wildlife Planning" will involve continual updating of operational plans as a result of performance controls and evaluations.

FISHERIES

Peter H. Oatis
Chief Aquatic Biologist

Since the commitment to comprehensive planning and programmed management, made in October 1977, the Fisheries efforts have been directed at compiling, consolidating and coordinating reams of pertinent information about resource supply and users that are vital for establishing and evaluating the Division's fishery program objectives.

Fisheries programs are now broken down into the following categories:

a. Lake Fisheries
b. Stream Fisheries
c. Anadromous Fisheries
d. Specialized Fisheries
e. Technical Assistance

Division managers and biologists have been active on all segments of the program; data collection and processing, as well as maintaining the day-to-day operation of active projects. Activity under these categories are:

Lake Fisheries

Fifty lakes, ten in each management district, were surveyed to update physical and biological assessments. From the data collected, plus historic information, standards for fish growth assessment, stock density and productivity were established. Detailed maps of the lakes were produced along with updated fisheries information relative to access, species present and competitive water uses were printed and made available to the public. Specific fisheries management recommendations were established, priorities were set, and recommendations were implemented where possible.

Extended efforts were made in cooperation with the Divisions of Water Pollution Control and Water Resources in developing a computer-operated, data-storage information bank. This program is now operational and should greatly facilitate storage and retrieval of current information pertaining to the lakes of the Commonwealth. It will also highlight information gaps and eliminate much duplication of effort by all agencies collecting lake data.

Stock assessments of bass and pickerel clearly demonstrate the need for revisions in statewide regulations governing these species and will, no doubt, influence the decisions of the Fisheries and Wildlife Board as they address proposed management schemes for these species.

The use of the computer and survey designs give the Division the ability to focus on the fisheries problems and potentials unique to each lake. The implementation of unique programs and objectives should greatly enhance the effectiveness and efficiency of lake fisheries.

Stream Fisheries

Concurrent with the lake fisheries investigations, stream survey crews have been actively assessing all stocked trout waters. We now have good information about wild trout supplies and production, as well as information on the survival of stocked trout. When this data is combined with use information currently being collected by field observations and telephone survey inquiries, program objectives will be set and implementation will begin. Much of the data, at this point, indicates that we have a number of streams in Worcester and the counties to the west that produce good trout populations on their own. Current stocking allocations to these streams can be redirected to other waters where they will be put to better use. Stream data will soon be processed by computer programs in cooperation with other state agencies. This capability and the classification systems being developed will greatly enhance ability of staff biologists to comment upon and evaluate the numerous environmental impact reports which are addressed each year. This data is also of paramount importance in resolving cases subject to mitigation and setting priorities for Division development projects such as placing of stream improvement structures, fish barriers or protective devices, and land purchases that require the expenditure of thousands of dollars.

Anadromous Fisheries

Present efforts focus primarily on the Connecticut, Merrimack and Charles Rivers. Shad and salmon passage at Holyoke was the second highest on record at 256,000 and 19 respectively. In total, 51 salmon were taken from the watershed for brood stock purposes. Mortality of captured salmon was low and, as of this writing, over 107,000 salmon eggs have been taken at the Berkshire Federal Fish Hatchery. The young produced from Connecticut River returns should greatly enhance the restoration efforts in the years to come. This year also marked the completion of the Turners Falls fishway which will provide shad with an additional 20 miles of spawning and nursery habitat denied them since 1797. The sport fishery at Turners Falls is expected to become the best on the river.

On the Merrimack, two salmon were creeled by sportsmen fishing below the Essex Dam for shad. The catch of salmon gives some indication of the improved water quality in the area. A small but intense shad fishery exists at Lawrence with many anglers getting 10 to 20 fish per day. As the run of fish increases, the potential fishery at Lawrence and Lowell will provide thousands of hours of recreation for Northeast anglers.

Fish passage facilities at Essex and Pawtucket dams will soon become a reality. The Lawrence Hydroelectric Company has initiated construction of a fishway at Lawrence scheduled for completion by the spring of 1981. Several companies are currently interested in developing hydro facilities at Lowell in full recognition of their fish passage responsibilities.

The transportion of 1,100 shad from the Connecticut to the Charles River was sufficient to produce young in the Newton-Needham area. These young are expected to migrate this fall and return to the Charles River three and four years from now. Similar efforts were successful last year. Significant shad increases are expected in the Charles by 1981 and 1982.

Specialized Fisheries

These fisheries entail unique programs designed to lend diversity and particular qualities not commonly found within the state, to certain areas. They entail the maintenance of unique populations of fish or the imposition of unique regulations designed to enhance the quality of an existing fishery that could not otherwise be maintained without the expenditure of additional funds and energy.

Northern pike fisheries certainly fall into this category. This year, the Division was fortunate enough to be able to purchase additional supplies of pike from Minnesota with the financial assistance of the Metropolitan District Commission. These fish were stocked to maintain the thriving fisheries at East Brimfield Reservoir and Quaboag where individuals up to 18 pounds have been caught as well as to provide for introduction at Lake Attitash, Amesbury; Charles River, Newton; Ponkapoag Pond, Canton; Lake Quinsigamond, Worcester; Hammond Pond, Newton; Chequaquet Pond, Barnstable, Snipatuit Pond, Rochester; Lake Rohunta, Orange; and Lake Buel, Monterey. Pike introductions to the above waters were primarily based upon the recommendations produced by the previously-cited lake investigations. As a result, there will be pike fishing opportunities in all five management districts. Information obtained this summer indicates that many such legal pike, averaging 18 to 22 inches, were caught this summer. Many of these fish will be approaching the legal length of 28 inches by late spring of 1980. Recognizing that the availability of pike for stocking is something on which we cannot rely, a one-year commitment from the State of Pennsylvania for 10,000 eight-inch tiger muskie, to be delivered during September 1980, has been obtained. These fish lend themselves readily to common cultural techniques and will provide the basic information as to whether rearing them is a feasible project for Massachusetts to undertake in the mid-1980s.

Sea-run brown trout also fall into this category. To date, this program is still in the developmental stages, but results are extremely encouraging. Numerous fish in the five to ten-pound category have been creeled, catching the attention of national fishing magazines which note that the fishing is a challenge for the dedicated angler willing to brave the elements in pursuit of extremely wary prey. Program assessments by Project Leader Joseph Bergin, at professional meetings, have influenced the State of Maine in undertaking a similar program for their southern coastal waters.

Although selective rearing of brood stock has significantly enhanced growth and survival, hatchery problems have led to less than optimal supplies of smolts. This program and the Massachusetts Division of Marine Fisheries' coho program both received a financial boost in the form of federal aid from the U. S. Fish and Wildlife Service which is currently being used to upgrade production facilities at the state fish hatchery at Sandwich. Hopefully, in the near future, both of these programs will have numbers and quality of smolts necessary to meet immediate and long-range program objectives.

Nineteen seventy-nine was also the first year that the Division experimented with catch-and-release regulations along the upper mile and a half of the Deerfield River. Pressure during the early part of the season was low as anglers pursued trout they could creel, but as supplies dwindled, the recreational value of the fishery in this section of the river became apparent.

By mid-June, angler counts indicated a significant fishery along the upper reach that continued throughout the summer months. The objective of doubling the summer use and catch at no additional expense, in terms of stocking, was easily met. The quality of the fishery in the designated area served to attract anglers from across the state and from as far away as New Jersey and Michigan, giving an economic boost to a portion of the state that is heavily reliant upon the tourist industry. Angler comments recorded by the creel agents overwhelmingly expressed favor of the program.

In conjunction with the volunteer efforts of Ilo Howard, the section is participating in initiating an urban angler program designed to draw attention to inner city fishery resources. This program is currently focused on Boston. With the proper funding, volunteer participation and coordination, similar programs will, in future, be available to such areas as Lawrence-Lowell, Springfield-Holyoke, and Fall River-New Bedford. Both the fisheries supplies and potential anglers represent untapped resources that can be developed in the years to come.

Technical Assistance

This is a new project that was basically set up to allow the Division to become eligible for Federal Aid for activities that always were part of ongoing programs.

These activities include consulting with other Federal, state and local government agencies as well as private citizens and organizations on matters of mutual concern. Such activities include review and comment of environmental impact assessments, local fisheries assessments, tagging operations, fish kill investigations and advice to private pond owners. It is estimated that approximately 20 to 25 percent of staff time is currently spent in activities of this nature with every indication of this workload increasing as numerous agencies become increasingly aware of the importance of maintaining environmental integrity in the light of the respective missions of their individual agencies.

HATCHERIES

David Fredenburgh
Chief Fish Culturist

Fiscal 1979 proved to be a fairly good year for the Commonwealth's hatcheries. Although production was lower than normal, the quality of trout was higher. Production was down slightly because of a large fingerling mortality during Fiscal 1978. The outlook is bright for Fiscal 1980 due to low mortality, less vandalism and poaching, and generally better available water supplies.

The Palmer Experimental Salmon Hatchery finally began Atlantic salmon production in March 1979. This installation has been under renovation during the past six years and the Division's efforts to produce salmon were hit or miss. The hatchery is designed to produce about 60,000 smolts per year. Due to the design and construction, other cold-water species could be cultured there in the future if and when the production of salmon is no longer necessary. The hatchery could easily be converted to programs dealing with fish culture research, brood stock or a trout production station. The success of the Palmer renovation is a tribute to the diligence, expertise and dedication of the hatchery staff.

The East Sandwich hatchery is also presently being renovated for the production of coho salmon. This is a joint project between the Division of Fisheries and Wildlife and the Division of Marine Fisheries. The project is being funded by the Division of Fisheries and Wildlife, Marine Fisheries, U. S. Fish and Wildlife Service and the National Marine Fisheries Service. After securing funding and a design, the site work was completed during the summer.

The design of the hatchery is essentially the same as at Palmer. Above-ground round fiberglass tanks were specified and ordered and a sump tank for reservoir water was built. The coho hatchery is expected to be in operation by the fall of 1980. As was the case with the Palmer hatchery, the project is being designed by in-house staff and will be constructed, wherever possible, by Division personnel.

It must be mentioned that the YACC crew at both Sandwich and Palmer (covering the hatcheries in Palmer, Belchertown, Sunderland and Montague) completed many projects that otherwise could not have been done. Among there were:

1. Building a pump house annex at Palmer hatchery.

2. Rebuilding pools at the Sandwich hatchery.

3. Clear cutting and liming ten acres at McLaughlin hatchery.

4. Installing a security fence at the Montague hatchery.

5. Building a restroom at the Sunderland hatchery.

The Sunderland hatchery again had the opportunity to hire an eight-member CETA crew to rebuild two series of fish ponds. This project was completed along with several lesser projects such as brushing out areas, mowing lawns and rebuilding some water structures.

General fish culture activities continued on a normal basis at all three of the hatcheries in the Valley. Many maintenance programs were increased due to additional personnel from CETA and YACC and additional funding from the Development account. Because of these programs and extra effort by hatchery staffs, the hatcheries are in better shape than usual.

A present priority is the completion of the East Sandwich coho hatchery. This construction must progress so that production will be underway by the end of the calendar year 1980.

Another high priority item is developing solutions for pollution problems caused by some of our hatcheries. The McLaughlin pollution project has been at a standstill for too long and must be budged off dead center.

Along with these goals, the hatchery aims to maintain present production but align that production to accommodate the needs of fishery management programs.

Production Figures, 1978-1979

	2-4"	6"	6-9"	9-12"	12+	Weight	Total
McLaughlin							85,000 (T)
Rainbow	85,000 (T)	0	85,540	156,599	0	137,870	242,139
Brook	0	0	158,750	7,337	1,935	42,925	168,022
Brown	0	0	19,900	22,600	0	16,499	42,500
Totals	85,000 (T)	0	264,190	186,536	1,935	197,294	537,661
Montague							
Rainbow	0	0	0	56,290	0	70,037	56,290
Brook	0	0	0	10,800	0	10,536	10,800
Brown	0	0	0	0	0	0	0
Totals	0	0	0	67,090	0	80,573	67,090
Sunderland							
Rainbow	0	0	34,700	45,670	0	59,458	80,370
Brook	0	0	27,100	0	0	3,749	27,100
Brown	0	0	0	19,500	0	17,390	19,500
Totals	0	0	61,800	65,170	0	80,597	126,970
Kokanee	155,000						155,000
Kokanee	10,000 (T)	0	0	0	0	415	10,000 (T)
Palmer							
Rainbow	0	0	0	3,700	0	2,410	3,700
Brown	0	0	0	0	3,000	3,289	3,000
Total	0	0	0	3,700	3,000	5,699	6,700
Sandwich							
Rainbow	0	0	24,000	70,550	0	43,920	94,550
Brook	0	0	25,175	2,200	0	6,291	27,375
Brown	0	0	13,800	8,500	0	9,496	22,300
Totals	0	0	62,975	81,250	0	59,707	144,225
Coho	0	0	46,436	0	0	4,027	46,436
GRAND TOTALS	95,000 (T) 155,000	0	435,401	403,746	4,935	428,312	1,094,082

WILDLIFE

Chet McCord
Chief of Wildlife Research

The Wildlife research section is charged with the responsibility of providing the Division with the information necessary to make sound wildlife management decisions. The task is one of monitoring wildlife populations, as well as the environmental and social factors which influence those populations, so that the status and trend of the wildlife resources can be determined. When a species' population, for example, gets too high or too low, then it is this section's role to recommend to the Fish and Wildlife Board changes in regulations and provide supportive information about these changes. This year, the section's recommendations led to the following regulatory changes:

The crow season was brough into conformity with Federal guidelines as crows are protected by the Migratory Treaty Act and are, therefore, a federally-protected species. Under these federally-established guidelines, the season may be up to 124 days long but it may not include the peak nesting season. The Massachusetts season had been split with the first segment opening 1 January and closing 31 March and the second segment opening 19 August and closing 30 September. Other states had opened their seasons for only a few days a week and thereby extended the 124 days over a longer period. Under new regulations, the season now opens 1 January and runs to 10 April, then reopens 1 July and runs to 31 December. In both segments, crows can be hunted on Fridays, Saturdays and Mondays only.

The primitive firearms season was studied extensively this year. However, the Board did not come to any conclusion. The primary problem was that the season had developed into something very different from what was originally intended. Under the original concept, the season was to provide an opportunity for sportsmen to hunt as their forefathers did during the period around the 1850s. The type of weapon used at that time was a key factor and was to be limited to caplock, flintlock, tubelock, wheel-lock or matchlock. A problem developed when the definition of caplock was not tight enough to eliminate such innovations as a modified shotgun or an adapter plug which would convert any shotgun into a "muzzle loader." This conflict of new technology with the traditions of the past should be concluded early next year.

The raccoon hunting regulations were modified to eliminate a grey area in the wording which could have been interpreted to mean that a limit of raccoons had been taken if three animals were run with dogs even though no raccoons were taken or killed.

Wildlife management area regulations were changed starting with the Westboro Wildlife Management Area where there was a problem with horseback riders and no effective regulations to stop hunting in the beagle area. New regulations were passed which state that it is not permissible to possess, lead, ride, and so forth a horse on the Westboro area and that the beagle area is closed to all hunting. Problems had also developed with the hunting hours on wildlife management areas during the pheasant season. Under old regulations, it was illegal to hunt on any wildlife management area before sunrise or after sunset from 10 October to 2 January. The original intent of that regulation was that reduced hours be in effect during the pheasant season. Unfortunately, the wording of the old regulation included all upland game birds. Thus, when the ruffed grouse season was extended, the limited hunting hours were extended as well. The Board defined the length of time the restricted hours would be in force on wildlife management areas by limiting them to the pheasant and quail season, and further noting that the reduced hours applied only to wildlife management areas that were stocked with pheasant and quail.

Other wildlife management area regulations included the establishment of permits for harvesting timber and other activities. Formerly it was illegal to remove anything from a wildlife management area including berries, nuts and other wild crops. The term "field" was redefined to eliminate problems with people driving on and making new roads on Division lands. Finally, new rules were passed to eliminate possession of alcoholic beverages without a permit.

New Federal regulations stimulated changes in the Massachusetts laws regarding exposure of poisons in the control of wildlife. Minor changes were made in the regulations regarding exposed chemicals to bring them into conformity with new Federal and state standards.

Wildlife sanctuaries have been an important but small part of the Division's management in past years, but regulations had not been adopted governing sanctuary use. State laws do provide the basic framework but allow the Division to draft regulations. An eleven-point regulations package was adopted which defined activities which would be illegal on sanctuaries--including hunting, trapping, removal of vegetation, dumping, campfires--and established an opening and closing time for these areas.

Since Penikese Island is a wildlife sanctuary, but is also used in part by a school, a special regulation was passed which allowed the school's use of the area. Restriction of the area and permissible activities were defined.

The special hunt for paraplegic sportsmen used to open during the first full week in November. This was changed to the last week in October to avoid conflicts with the opening of the archery season.

The Newbury Wildlife Management Area has traditionally been the site of a controlled pheasant hunt on days of high hunting pressure. On Saturday mornings, for example, the area would be opened to the first 200 hunters and then the area would be closed at noon and restocked with pheasants for an afternoon hunt. This afternoon hunt proved undesirable and the Board moved to eliminate the afternoon stocking. In addition, technical changes were made in regulations dealing with the controlled waterfowl hunt on the Delaney Wildlife Management Area.

Falconry field trial regulations were adopted which permitted holding of falconry meets and made allowance for participation by out-of-state falconers.

Research activities of the Wildlife Section during the fiscal year related to:

Beaver

A total of 1016 beaver were taken by 128 trappers in 110 towns during the 1978-1979 season. This was 650 less than in 1977-1978 and 248 less than a ten-year (1969-1978) average harvest. As predicted, low fall pelt price with resultant reduced trapper effort was probably a major factor in the overall decline in the harvest.

Otter and Fisher

During 1978-1979, a total of 121 otters were taken by.64 trappers in 73 towns for a mean of 1.9 otter per successful trapper. This compares with a take of 163 and a mean of 2.3 for 72 trappers in 1977-1978. The fisher harvest increased from 37 in 1977 to 45 in 1978 with 26 trappers taking fisher in 25 towns for a mean harvest of 1.7 fisher per successful trapper. Worcester (32), Franklin (20), and Berkshire (18) Counties provided the most otter, while Worcester County yielded the most fisher (23). Otter were taken primarily in November and December, and fisher primarily in November. A total of 70 otter and 37 fisher carcasses were received from cooperating trappers. The mean age of otter taken in 1978-1979 were 2.54 years and for fisher 1.68 years. This compares with a 1977-1978 mean age of 2.56 for otter and 1.5 for fisher.

Mourning Dove

Calling doves were counted along 17 randomized routes in cooperation with the U. S. Fish and Wildlife Service's annual mourning dove breeding population census. The total number of calling doves on three comparable routes increased 117 percent from 1977 to 1978, but decreased 39 percent from 1978 to 1979. Fourteen new routes were added in 1979 providing a combined total of 103 calling doves.

Bobwhite Quail

Whistling quail were tallied along 18 routes in three southeastern Massachusetts counties in early summer of 1979. The weighted call indices for Barnstable, Bristol and Plymouth Counties showed no significant difference from 1977 indices. Annual indices were significantly different from a four-year mean index for Barnstable and Plymouth Counties.

Turkey

Turkeys in western Massachusetts continue to expand in numbers and distribution with birds now reported throughout Berkshire County, most of Franklin County and parts of Hampshire and Hampden Counties. A spring gobbler season is a practical reality and is recommended for 1980. Nine turkeys were trapped in Berkshire County in March 1979 and transplanted to Hubbardston State Forest in Worcester County. Based on a population model incorporating annual productivity and mortality, the spring 1979 breeding population in Massachusetts was estimated at 750 turkeys.

Black Bear

A record number of 574 bear hunting permit applications was received during 1978. The legal kill of five bears was the greatest since the season was changed in 1970. The mean age of bear taken by hunting was 5.55 years. One train mortality and one capture-related death also were recorded. New reports of 51 observations totaling 65 bear were received from 32 towns. Ten nuisance complaints were received with apiary and corn damage predominating. One unsuccessful attempt at translocation was made.

Deer

Three male and three female deer were harvested by paraplegic hunters in Nantucket and Berkshire Counties during the special two-day season, 2-3 November. During the 18-day (6-25 November) archery season, bowmen reported 167 deer--101 males and 66 females. Mainland archers reported 148 deer taken--92 males and 56 females. The four mainland counties with the highest archery harvest were Berkshire (52 deer), Franklin (21 deer), Hampden (14), and Hampshire (28 deer). On Nantucket Island archers reported 16 deer (7 males and 9 females). Two males and 1 female deer were reported by Martha's Vineyard bowmen.

Shotgun hunters reported harvesting 2652 deer during the six-day (4-9 December) shotgun only deer season. Of these, 1896 were males (172 male fawns) and 756 were females. Mainland shotgun hunters reported 1606 adult males, 119 buttonbucks and 613 females for a total of 2338 deer. The top-ranking deer producing counties are: Berkshire (1047), Franklin (500), Hampden (242) and Worcester (208). Nantucket shotgun hunters reported 143 deer (63 adult males, 28 male fawns and 52 females). On Martha's Vineyard, a total of 118 deer were taken (47 adult male, 24 male fawns and 47 females) and 54 deer were removed from Gosnold Island.

During the special three-day primitive firearms deer season (18-20 December), the muzzle loaders reported harvesting 183 deer statewide (69 males and 114 females). During this season, the most important counties were Franklin, 61; Hampshire, 27; Worcester, 24; and Berkshire, 9.

Waterfowl research activities conducted during the fiscal period included the following:

Gosling Transplant Program

A final report was prepared summarizing results of the gosling transplant program from 1967 to 1979. A total of 427 geese were transplanted to 12 sites in central and western Massachusetts. Released geese nested on six of the release sites and at least five other nonrelease sites. More extensive nesting was suspected based on data gathered for the breeding bird atlas. Assistant Game Biologist James Pottie and Project Leader H W Heusmann presented a paper on the taxonomy of eastern Massachusetts geese at the Thirty-Sixth Annual Northeast Fish and Wildlife Conference held in Providence, Rhode Island. Measurements of adult geese indicated that three subspecies were represented in Eastern flocks--the interior race, the Atlantic race, and the giant race--with evidence of extensive interbreeding.

Preseason Waterfowl Bandings

A total of 1110 birds were banded during the 1978 preseason banding segment. This total included 111 hand-reared wood ducks. Wild-banded waterfowl included 291 wood ducks, 294 mallards, 142 black ducks, 22 mallard x black hybrids, 111 green-winged teal, 73 blue-winged teal, 2 wigeon, 1 pintail and 1 mallard x unknown hybrid. Also banded were 2 soras, 2 gallinules and 1 coot. A cooperator banded an additional 20 least, 7 semi-palmated, 1 solitary and 14 spotted sandpipers, 2 semi-palmated plovers and 3 killdeer.

Winter Inventory Flights

A total of 168,869 waterfowl were counted during the January 1979 winter inventory, up 7 percent over 1978 and 49 percent over the 10-year average. Black ducks (13,931) were down 55 percent from 1978 and 33 percent below the 10-year average. Mallards, mergansers, buffleheads and canvasbacks were all down substantially from last year, but still above the 10-year average. Goldeneyes were unchanged from 1978, down 14 percent from the 10-year average. Exceptionally high counts were recorded for scaup (25,736), sea ducks (89,099) and Canada geese (16,192).

Winter Banding Program

The winter of 1978-1979 was atypical with unusually mild conditions prevailing until early February when a record-breaking cold spell set in, freezing over most bays and harbors. Some starvation resulted. Fortunately, the earlier mild weather meant most birds were in excellent condition prior to the cold weather, enabling them to survive the freeze. Division personnel and cooperators banded 1216 black ducks, 154 mallard x black hybrids, 49 mallards, 14 pintail, 2 wigeon and 3 green-winged teal.

Black Duck Imprinting Project

A final report summarizing the results from 1971 to 1979 was presented at the Thirty-Sixth Annual Northeast Fish and Wildlife Conference by Project Leader H W Heusmann, former Chief of Wildlife Research Warren Blandin, and Connecticut Valley District Game Manager Peter R. Pekkala. Black ducks were released annually on three areas during 1973-1975. Single releases of ducks

were made on three additional areas in 1975. A total of 219 male and 245 female black ducks were released. At least 11 percent of the females nested. Although 287 ducklings were hatched out in cylinders, only 1 nonreleased black duck was known to have nested in a cylinder during the study. This lack of yearling recruitment led us to conclude that the project was unsuccessful.

Park Waterfowl Investigations

Banding data for 5783 mallards banded in 19 Massachusetts parks during the years 1970-1976 was tabulated and summarized by banding site, year, age and sex. This data will be sent to the Patuxent Wildlife Research Center in Laurel, Maryland for computer analysis to determine survival rates.

Wood Duck Dump Nesting Study

The final report for this study was accepted for publication by the *Journal of Wildlife Management*. The results, presented by Project Leader H W Heusmann, Field Agent Robert Bellville, and Assistant Game Biologist Richard G. Burrell, indicated that prior presence of eggs in nest boxes did not affect nest initiation or nest attendance by wood ducks. Their attempts to artificially create dump nests using game farm wood duck eggs was only marginally successful and no large broods resulted. They also discovered that 75 percent of hens that dumped one or more eggs in nests eventually incubated by other wood ducks later incubated clutches of their own, and concluded that dump nesting was beneficial to box-using populations of wood ducks.

Evaluation of Starlingproof Nesting Structures

Waterfowl usage on eight ponds in eastern Massachusetts, where all boxes were equipped with 100 x 100mm skylight lids, was 38 percent. Starling usage was nine percent. On three eastern Massachusetts ponds, where boxes were equipped with both light lids and control lids, wood duck usage for light lids was 20 percent; whereas their use of boxes with control lids was 55 percent. Starling use of light lids was zero while their use of control lids was 22 percent. In western Massachusetts, eight areas were tested for light lid versus control lid acceptance. Here, wood ducks and/or hooded mergansers used five percent of the skylight-equipped boxes and 35 percent of the control boxes, while starlings used 33 percent of the skylight boxes and 13 percent of the control boxes.

Waterfowl Gizzard Shot Survey

A total of 1266 gizzards were examined since this study's inception. Shot ingestion rates varied from one percent for Cape Cod to 3.5 percent for Buzzards Bay. Gizzard examination in past years was by manual examination under a dissecting scope. Future examinations will be made by x-raying or fluoroscoping gizzard contents.

The W-9-D project is concerned mainly with the management of wildlife management areas. However, wood duck nesting boxes are erected and maintained on this project.

During Fiscal 1979, the following projects were completed under Project W-9-D:

Three headquarters buildings were maintained on the Birch Hill, Martin Burns and Crane Wildlife Management Areas. Eight storage buildings were maintained on the Housatonic Valley, Birch Hill, Martin Burns (2), Crane Wildlife Management Areas and at Central (2) and Western Wildlife Districts. Three dams were maintained on the West Meadows and Swift River (2) Wildlife Management Areas. One footbridge was built on the Martin Burns Wildlife Management Area.

A gravel road of .3 miles was constructed for access to the Swift River Wildlife Management Area. Roads and trails were maintained by graveling, grading, cutting brush, limbing overgrown trees and plowing snow. In all, a total of 77.8 miles of roads were maintained.

Four new parking lots were constructed on the Bill Forward (1), Birch Hill (1) and Hockomock (2) Wildlife Management Areas. In addition to these, existing gravel parking lots were maintained by graveling and grading while grass lots were maintained by mowing. In all, a total of 45 lots were maintained on 13 areas.

Fifteen waterfowl blinds were maintained on the Delaney and Ludlow Wildlife Management Areas. Blinds were maintained by replacing and repainting broken boards and supports. Informational signs were posted and repaired on 28 management areas. Among these were carved area entrance signs, signs indicating times of sunrise and sunset, area rules and regulations and various directional signs. In all, a total of 985 signs were erected and maintained. Signs were supplemented by metal boundary markers placed on corner bounds and along back land and white area designation signs placed along roadsides. Between signs and boundary markers, a total of 58.2 miles of management area boundaries were marked.

Trees and shrubs were planted to establish hedgerows for wildlife food and cover. Species planted include Scotch pine, red pine, dogwoods, honeysuckle, hanking cherry, autumn olive and crabapple. A total of 1800 shrubs and 450 trees were planted on the Bolton Flats, Myles Standish and Swift River areas. In other locations, fields were limed and fertilized to produce adequate cover and portions of fields were planted to annual grains to produce food and cover strips. In all, a total of 148 acres were limed, fertilized and planted. On other areas, the Division undertook cooperative farm agreements where a farmer planted a crop of hay and left portions unharvested for wildlife food and cover. About 600 acres of fields were maintained in this manner.

A special project was undertaken at the Swift River Wildlife Management Area where one acre was cleared to regenerate a degenerated clone of male aspen for improved ruffed grouse habitat.

In other sections, brush encroaching on fields and cleared areas was controlled by mowing with a rotary brush cutter, hand cutting and herbicides. Under this segment, a total of 422.5 acres were controlled.

The W-9-D project extended beyond maintenance and development in 1979. Under the other portions of this project, over 800 wood duck boxes were constructed, erected and maintained statewide in suitable wood duck habitat. Approximately 2.5 miles of rotten barbed wire fencing was removed from the Hinsdale Flats and Erwin S. Wilder Wildlife Management Areas and a burned-out building was removed from the Wilder area.

Additional time was spent on management of water levels on the Delaney area, project administration, area inspections, managed public hunts and in the repair and maintenance of equipment.

GAME FARMS

E. Michael Pollack
Chief Game Biologist

During this fiscal period, 1 July 1978 to 30 June 1979, major pen construction was accomplished at all the game farms. The CETA and YACC programs were of great aid in supplying labor. All pens destroyed during the previous winter storms were either repaired or replaced with new pens.

Game bird production was normal with the utilization of good management techniques. Vandalism occurred at all the farms resulting in a small loss.

All game bird feed formulas were updated in an effort to obtain better nutrition and lower food costs. However, feed costs continued to climb although not quite as sharply as in previous years.

Game Farm Production

1978 - 1979

Pheasant

Game Farm	SR	A	B	C	PG	Misc*	Total
Sandwich	250	-	1,744	4,178	4,956	400	11,528
Wilbraham	1,920	-	4,040	8,248	5,168	550	19,926
Ayer	2,517	100	3,424	4,488	13,761	800	25,090
Totals	4,687	100	9,208	16,914	23,885	1,750	56,544

*Misc. - Field trial birds, displays, youth hunt, etc.

Quail

A total of approximately 3,000 quail, produced at the Sandwich State Game Farm, were released on the wildlife management areas in the Southeast Wildlife District. In addition, approximately 500 quail were distributed for field trial purposes.

White Hare

A total of 825 white hare were purchased from a source in New Brunswick, Canada. Releases were made in all five districts.

STATE ORNITHOLOGIST'S REPORT

Bradford G. Blodget
State Ornithologist

The State Ornithologist is responsible for the conservation and management of nongame and endangered species, working closely with the Chief of Wildlife Research, as land management decisions have an effect on nongame as well as on game. Nuisance animal problems have both game and nongame aspects. A broad array of environmental impact studies and environmental notification forms are received annually, but only a small percentage of them receive rigorous review and comment. Most of these projects have potential effects on both game and nongame.

Biologically, the population dynamics of "game" species are not always very different from those of "nongame" species. As State Ornithologist, I have tried to work toward cooperation with the game biologists and an integrated approach to comprehensive wildlife management.

In keeping with this philosophy, I have taken pains to point out that lands owned and managed by the Division provide habitat for hundreds of nongame species along with game species, a fact that is frequently overlooked by sportsmen and nonsportsmen alike. Pursuing this, I have encouraged people who express a vague desire to "help wildlife" to purchase a license regardless of whether or not they intent to hunt.

The Division's nongame and endangered species program continued to suffer from lack of funding. However, in addition to dealing with problem wildlife matters, exotic wildlife permit operations, and consulting with individuals on nongame and endangered wildlife, the following areas of activity have been paramount in Fiscal Year 1979.

Legislative Work

Work continued on a nongame bill that would be acceptable to the Division of Fisheries and Wildlife. The Ornithologist attended many legislative meetings pertaining to the nongame bill. At this writing, the Division-favored bill filed by Senator Carol Amick, S-1986, differs substantially from a House version, H-855, filed by Representative Joseph Manning of Milton. The latter version contains much troublesome language and would likely be incompatible with existing Division programs. The apparent irreconcilability of these two bills makes the prospect of a nongame bill emerging from the present legislative session very doubtful.

The Ornithologist also testified before the Committee on Taxation in support of S-1341, a bill that would have allowed individuals to designate funds for nongame wildlife by an income-tax refund check-off.

As in 1978, the State Ornithologist testified in favor of several other bills: one to extend the Division's authority to investigate and regulate reptile and amphibian populations, and another that would amend Section 26A of Chapter 131 relative to the endangered species list. These two bills seem to have brighter prospects for passage.

Cooperative Endangered Species Agreement

During FY 1979, the State Ornithologist filed qualifying documentary material with the United States Fish and Wildlife Service in support of the Division's application for a cooperative agreement for the management of endangered species of fish and wildlife. Final agreement, under which the Division will be eligible for two-thirds (2/3) grant-in aid monies for approved endangered species projects, is expected in August 1979.

Endangered Species Activities

In April 1979, an administrative bulletin detailing special handling procedures for endangered species was distributed in all district offices.

In January 1979, the Division participated in the National Wildlife Federation's nationwide bald eagle census. A total of eight bald eagles and one golden eagle was recorded in the Commonwealth. Except for a bald eagle at Nantucket Island, all the wintering eagle population was found to be concentrated (as expected) in the Quabbin Reservation. Reports of summering eagles within the Quabbin Reservation persist, but no nesting is believed to have occurred. The Division continues to monitor for breeding activity and continues to be interested in hacking eaglets in the Quabbin area, but a formal project application has not yet been submitted to the United States Fish and Wildlife Service.

In February, the State Ornithologist attended a meeting of cooperators in the peregrine falcon restoration effort at Albany, New York. The Division has continued its full support for the Peregrine Fund's restoration project at Mount Tom in Holyoke. Six birds were released at this hacking station in 1979. The permit section issued a 1979 depredation control permit in conjunction with the peregrine work for the control of great horned owls in the vicinity of the release site. The Ornithologist field-checked certain historic eyries for signs of nesting activity with negative results. Monitoring of these sites will be continued in the future since the increasing population of released birds annually increases the likelihood that a natural nesting will occur.

During the winter months, a peregrine tiercel wintered in downtown Boston, frequently roosting on a ledge of the McCormick State Office Building. Despite telescopic scrutiny, it could never be determined with absolute certainty whether this individual was a banded specimen released by the Peregrine Fund or an unbanded Arctic bird. The State Ornithologist inspected this site with Dr. Thomas Cade and personnel from Cornell University, who installed a special nesting structure should the wintering bird attract a falcon and attempt to nest. This possibility did not materialize as the bird departed during early March. The site, however, is likely to attract birds in the future and could even be used as a hacking station. Some further structural modifications will be made at the site to render it more attractive as a nest site.

During FY 1979, the Ornithologist continued to work closely with the U. S. Fish and Wildlife Service in development of a proposal listing the Plymouth red-bellied turtle as an endangered species and delimiting "critical habitat" for this species in the Town of Plymouth. A hearing on

this matter will be conducted in Plymouth by the Service on 4 August 1979. The Division continues to assist in and monitor Federally-funded life history studies of the turtle being conducted by Dr. Terry Graham, Professor of Biology at Worcester State College. During FY 1979, the Division also agreed to manage a 183-acre land parcel bordering Gunner's Exchange Pond purchased by the Nature Conservancy with the ultimate intention of selling the property to the U. S. Fish and Wildlife Service.

Tern Management Project

Due to lack of funds, the Division's operation in this important wildlife management area continues to be a largely passive one, confined to a coordinating role. No field work was carried out by Division personnel during the 1979 nesting season. The Ornithologist organized a meeting of all field cooperators at the Cape Cod National Seashore Headquarters at the conclusion of the 1979 breeding season. In 1979, the least tern population increased 17 percent over 1978 to reach an historic high of 1,734 pairs, thus seemingly confirming the belief that least tern populations may be the most resilient of all to habitat modification resulting from human activities. This nesting year, common and roseate terns posted substantial increases over 1978 of 33 and 20 percent to 6,168 and 2,023 pairs respectively, while the Arctic tern population declined 15 percent to 45 pairs. No population estimate was available for the Arctic tern for Noman's Land, which could account for the drop in pairs. The roseate tern figures are being watched particularly closely as, worldwide, the roseate tern is known to nest in only a few large colonies, Bird Island, Massachusetts being one of them.

Great Blue Heron Investigation

On 12-13 June, the State Ornithologist, with the assistance of James Cardoza and Winston Saville, conducted a statewide inventory of all known great blue heron rookeries in the Commonwealth. Historical data are poor for this wader, but it has apparently never been a widespread nester in the Commonwealth. This year's inventory resulted in the confirmation of 28 active nests distributed among six locations--three in Berkshire County and one each for Worcester, Middlesex and Franklin Counties. Although the boundaries were not confirmed, it appeared that nine of the nests were on Division-owned lands--eight on the Becket Wildlife Management Area and one on the Bertozzi Squannacook Wildlife Management Area. Eight were counted at the Suasco Impoundment in Westboro which is managed for wildlife by the Division. Another six turned out to be within or nearly within the boundaries of the Otis State Forest. Four were found in Wendell on the property of the Connecticut Valley Resource Council. The last was at Three Mile Pond in Sheffield which is in the process of being cut and drained. It is entirely possible that additional rookeries exist. Without exception, all rookeries located were in drowned timber associated with beaver flowages except for the Westboro rookery which exists in drowned timberland behind a man-made impoundment. It is recommended that these rookeries be monitored annually.

Breeding Bird Atlas

This spring marked the sixth and final season of data collection for the Massachusetts Breeding Bird Atlas. The State Ornithologist continued to assist in field work associated with this project, covering a 36-block area in the south-central part of the Commonwealth. Collected data will be developed, keypunched, and computerized for storage. It is hoped that the data collected over the last six years can be published. The State Ornithologist will continue to work closely with the Massachusetts Audubon Society and will assist with this project wherever possible.

Exotic Animals Task Force

The final report of the Exotic Animals Task Force was presented to the Director in June 1979. Included in this report are recommendations relative to the artificial maintenance and propagation of birds, mammals, reptiles and amphibians and a recommendation on the Exemption List. The Task Force's report is currently under staff review. Recommendations for its implementation will be made early in FY 1980.

Other Activities and Miscellaneous

The State Ornithologist prepared a revised second edition to the official list of Birds of Massachusetts first published by the Division in 1978. This document becomes Fauna of Massachusetts Series Number One.

Because of the high volume of nuisance animal calls and lack of office personnel, record keeping relative to nuisance animal calls in the Boston Office was discontinued on 30 September 1978.

There were no oil spill incidents in FY 1979 requiring bird rescue and damage assessment operations.

Western Wildlife District

Winston Saville
District Manager

Probably the most "visible" activity of the District in any given year is the stocking of fish, pheasants and hare. During Fiscal Year 1979, Western District personnel were heavily involved in such stocking. During the fall of 1978, 7700 rainbow trout were released into the better streams and ponds of the district and 7000 kokanee fingerlings were stocked in Laurel and Onota Lakes. The following spring, 114,426 brook, brown and rainbow trout were released into stockable waters and an additional 85,800 kokanee fry were stocked into Laurel and Onota. Perhaps the stocking that generated the greatest interest among anglers was the 19 January stocking of 400 Northern pike, received from Minnesota and stocked into Lake Buel, Monterey.

During the fall, District personnel also stocked 5268 cock pheasants. Of these, 1040 were stocked prior to the opening of the season, 4228 were stocked during the season (2968 on wildlife management areas and 1260 in open covers), and an additional 413 birds (50 cocks and 363 hens) were released in the spring to both open covers and wildlife management areas.

White hare, received on 13 February 1979, were stocked in suitable covers in Great Barrington, Hawley, Heath, Hinsdale, New Marlborough, Rowe, Savoy and Windsor.

Another area which received considerable attention from District staff was that of surveys. Two surveys were conducted of woodcock singing grounds, mourning doves were surveyed through four call routes and a survey was conducted of great blue heron rookeries. Fisheries staff conducted a creel census on the newly-designated catch-and-release area on the upper Deerfield River to assist in assessing use and determining the success of the new program in that area.

During the winter months, game section staff assisted in the wild turkey project, cooperating with Project Leader James Cardoza in locating, baiting, trapping and tagging birds. These birds were taken in the Berkshires and transplanted to northern Worcester County where, it is expected, they will become the nucleus for a new turkey population.

The District was also involved with the bear project. Records were kept on bear sightings and District personnel provided advice and assistance in dealing with five specific complaints related to bear, three involving damage to beehives. During the bear hunting season, bear were checked at the District office and tooth samples were taken for subsequent age analysis.

Also checked during the appropriate seasons were beaver and other furbearers. District staff check and tagged pelts, gathered pelt measurements and harvest information, and collected carcasses for transmittal to the Westboro Field Headquarters.

As in the past, this District hosted a part of the special hunt for paraplegic sportsmen. Following the special hunt, District personnel distributed materials needed for the conduct of the three general deer seasons. During these seasons, District personnel operated a checking station at District headquarters in Pittsfield and, during the shotgun season, the staff operated three additional checking stations, including a mobile station designed and constructed in a remodeled Air Force surplus van which is now available as a mobile project vehicle.

Additional research efforts were related to the wood duck project as District personnel maintained 136 wood duck structures, among them 45 new nesting boxes and 17 starlingproof cylinders.

Land management, during this period, involved rehabilitation; i.e., liming, fertilizing, and seeding of a .6 mile trail on Canada Hill which had formerly served as a skidding road. A half-mile trail on the Peru Wildlife Management Area also received special attention. Twenty-two and a half acres were mowed to maintain established clearings. These were:

Canada Hill, 6 acres
Peru, 2 acres
Hinsdale Flats, 1-1/2 acres
Housatonic Valley, 8 acres
Stafford Hill, 5 acres

Other activities included the maintenance of parking lots at the Housatonic and Stafford Hill Wildlife Management Areas. A storage barn, obtained in a recent land purchase, was cleaned and the materials contained in the barn were salvaged. A bridge was constructed on the Hinsdale Flats area and the staff assisted in drawing up environmental assessment reports for certain management activities on these and other Division-owned properties.

Much of the District Manager's time has been devoted to the Division's interface with both the sporting and nonsporting public. He attended monthly meetings of rod and gun clubs and county leagues and participated in two trappers association meetings. In addition, he addressed five community club meetings, participated in two radio talk shows, and provided slide and discussion presentations to Berkshire Community College groups as well as to groups from local high schools.

District personnel participated in staffing the Division's exhibits at the Eastern States Exposition and took part in a variety of smaller exhibits and field events among which was the second annual canoe race on the Housatonic River which is co-sponsored by the Division.

Contacts were maintained with town and city clerks through the presentation of a special program at the clerks' annual dinner meeting. District personnel also helped to establish six new license sales outlets in the area.

In service to other organizations, the District Manager joined forces with staff from the Westboro Field Headquarters in conducting two training programs for personnel of the Berkshire District of the Department of Environmental Management. Approximately 100 trainees attended each session which was, by all accounts, most useful and successful.

The efforts of the District staff were augmented by the assistance of crews from CETA and the YACC programs. Under the supervision of District personnel, the CETA workers reclaimed several fields that were reverting to woodlands while the YACC crew converted a building next to the District headquarters into workshop and office space, took part in numerous salvage operations, and cleared a five-acre safety zone on the Moran Wildlife Management Area.

Preliminary investigations were initiated into the possibility of changing the location of the District headquarters. However, no action has been taken on this proposal at the present time.

Editor's Note: The District Manager's perennial willingness to assist in youth programs was recognized this year when Win Saville became the recipient of the Gene Moran Conservation Award, given each year for service to youth by the Wahconah Regional High School Rod and Gun Club.

Connecticut Valley District

Herman Covey
District Wildlife Manager

The Connecticut Valley District covers 49 towns on both sides of the Connecticut River from the Vermont and New Hampshire borders to the Connecticut state line. There are three counties in this region and the District takes in parts of all three, with the remaining sections of the three counties falling into the Western District. The region is blessed with trout streams, lakes and ponds and is traversed by a number of scenic highways. The countryside boasts the rich farmlands of the valley proper surrounded by rolling hills and some mountains. The Division has five installations in this area aside from the District headquarters--Wilbraham State Game Farm and fish hatcheries at Montague, Sunderland, Belchertown and Palmer. These are primarily trout-rearing facilities, but the station at Palmer is currently being converted to production of Atlantic salmon.

During Fiscal 1979, the Valley District staff pursued regular and traditional management and maintenance operations. One of the most visible of these is the stocking of pheasants, hare and trout. A total of 15,660 pheasants were stocked during this year; 3000 of these birds were stocked in open covers prior to the open season, 8604 were stocked during the season. An additional 4050 were stocked on wildlife management areas. Sportsmen's clubs in the area received 1550 cocks and 25 hens to be used in their pheasant rearing program and a surplus brood stock of 272 cocks and 1596 hens were released to selected covers throughout the district in the hope that they could continue natural production in the wild. One hundred eighty-five hare were stocked in open covers during this period. Hare are stocked to augment native populations and to establish hare colonies in suitable habitat.

Trout stocking is tallied by the calendar year rather than the fiscal year, so figures available are those for calendar 1978. During this period, a total of 169,150 trout were stocked--106,050 into streams, 63,700 into ponds--weighing a total of 91,996 pounds.

In addition to stocking, the District fisheries staff assisted in Division (and other) research projects, participating in the transport of Atlantic salmon from Vermont to Connecticut, assessment of fish resources in the Quabbin Reservoir, and surveying fishermen and their catch. They

participated in netting and creel census associated with the Northern pike project, assisted in the Connecticut River shad and Atlantic salmon projects, and provided manpower for the procedures involved in a largemouth bass inventory of ten ponds. Concurrently, they monitored water chemistry on many ponds, investigated fish kills and participated in a variety of workshops.

District personnel also assisted Division biologists in many wildlife research projects, among them wood duck field studies. Wildlife problems reported to the district were investigated and the staff trapped, removed and relocated numerous beaver and raccoons in addition to dealing with instances of problem ducks and geese.

During the deer season, District personnel operated two deer checking stations and assisted law enforcement officers. Cooperation with law enforcement was carried on throughout other hunting and trapping seasons as well. District personnel also recorded and tagged pelts of beaver, bobcat, otter and fisher.

Other efforts within the district focused on maintenance and improvement of lands and property. Among these were the development and maintenance of signs, barways and gates. Designated areas on the wildlife management areas were cut and cleared in accordance with the wildlife management plan, while other areas were fertilized and/or planted. In all, eight acres were limed and fertilized, two acres were planted to hay mix and clover. Other lands were leased to a farmer-cooperator and to this end a farmer cooperative lease agreement was designed and implemented.

To keep the public apprised of the activities of the District and the Division, the District staff built and helped staff the Division's exhibit at the Springfield-based Eastern States Exposition. The District Manager conducted classes of wildlife activities for Holyoke Community College, regional high schools, 4H groups, and YACC groups. He participated in four radio shows in Orange, Westfield and Greenfield, and participated in numerous public meetings. Among these are the meetings of the Hampden, Hampshire and Franklin County Sportsmen's Leagues, meetings of the Connecticut River Advisory Committees, meetings of the Scenic Rivers Committee and various meetings with the U. S. Fish and Wildlife Service, the U. S. Army Corps of Engineers, the R.C.& D. section of the U. S. Department of Agriculture, and meetings of numerous sportsmen's clubs and associations. As last year, the District Manager was heavily involved with programs involving CETA personnel and this year also with YACC personnel.

The District Manager and Chief Fish Culturist, working together, secured a CETA project for the Sunderland hatchery. The program ran from May through September. They attended numerous meetings, devised a work plan, entered contract negotiations, and conducted interviews. Once started, the project was administered by the Chief Fish Culturist.

The District Manager also worked on a CETA plan for the Wilbraham State Game Farm. After many meetings, preparing proposals, and so forth, the changed requirements in annual salary--with ceiling on earnings set at $7,090--our rates are higher so we no longer qualify under the program.

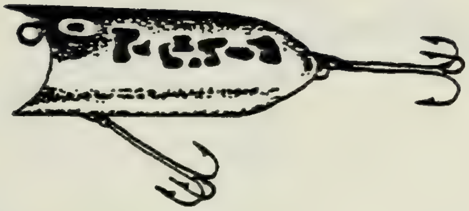
YACC

The District Manager has a new program assigned to the District to administer. There is a supervisor and 10 participants in this Young Adult Conservation Corps project. Six participants are stationed at the District and four are stationed at the Wilbraham State Game Farm. The work is varied in scope and covers a wide range of job experiences. This prepares the individual to be familiar with different jobs and, as a result, qualifies him for more types of work in future employment. The work accomplishments under the program were as follows:

Cemented garage floor, 40 ft. by 50 ft.; built cement block building for storage of flammable fluids; painted storage building; clear cut area for grouse management; cut logs and hauled to yard site; stacked lumber; cut and burned brush on woodland border; made signs with cut letters, painted and erected; assisted game farm operations; built rearing pens; repaired and maintained buildings (carpentry, plumbing and roofing); picked up roadside trash and cleaned up boat ramp; cleaned up after logging operations; cut logs; remodeled bathroom at YACC office building; assisted in District activities (fish stocking, beaver, shocked fish, stocked hare and planted shrubs); erected signs for field trials and marked plantings; constructed field trial building (dug footings, poured cement foundation, erected cement blocks, installed windows and roofs; building will be completed next year); finished comfort stations near field trial building; erected new chimney on resident house; landscaped around headquarters; maintained grounds; poured foundation footing and boarded up back and side of pavilion for storage; erected deer-proof fence; assisted setting up exhibit at Springfield; repaired duck blinds at Ludlow; did clerical work and took messages over telephone in absence of District Manager.

This program has been so successful that the Recreational Conservation and Development officers for Franklin County (USDA) contacted the District Manager for assistance in developing a YACC proposal. As this work must be done on public lands, Division management areas will benefit from the R.C. & D. program. Education efforts combining the forces of the R.C. & D. staff and the district staff will continue as part of this cooperative program.

Central District



G. Christopher Thurlow
District Wildlife Manager

During Fiscal Year 1979, personnel from the Central Wildlife District worked on the development and maintenance of four wildlife management areas. In cooperation with the YACC program and personnel, this District maintained 44.6 miles of roads, developed 33 hunter information signs, maintained 116 boundary and other information signs. Approximately 500 wildlife shrubs were planted and 86 acres were brush cut. Three cooperative farmers were added for agricultural work on wildlife management areas making a total of 14 farmers working on 10 areas.

The District maintained 162 wood duck nesting boxes and added 10 new boxes to new areas. We received 31 nuisance beaver complaints and relocated eight beaver. Seventy-two other types of nuisance animal complaints were received and 11 required direct District assistance. Sixteen live traps were loaned.

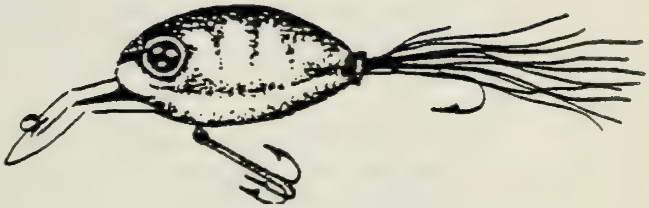
Forty-seven towns and eleven wildlife management areas received pheasant stocking. A total of 18,690 birds were released in the district. One hundred fifty-six snowshoe hare were released.

During the fall of 1979, 12 ponds and one river were stocked with 15,000 rainbow trout. During the spring of 1979, 106 streams and 30 ponds received 51,800 9-plus rainbow trout, 26,200 6-9 inch rainbow trout; 9700 9-inch plus brown trout, 3500 6-9 inch brown trout, 125 12-inch plus brown trout; 3250 9-inch plus Eastern brook trout, 54,000 6-9 inch Eastern brook trout, and 750 12-plus inch Eastern brook trout.

A total of 15 stocked streams in the French and Quinebaug River drainages were sampled during July and August. Samples indicated fair carryover of stocked trout but little natural reproduction was apparent. Ten ponds were sampled in June of 1979 to determine future management objectives. An extensive sampling program and creel census was undertaken at Wachusett Reservoir during the spring and summer of 1979.

Technical assistance was provided to one club and two private landowners in June. Maintenance was provided at five ramps and management areas with sign maintenance and trash collection comprising the bulk of the work.

Northeast District



Walter L. Hoyt, Jr.
District Wildlife Manager

The Northeast District performed its traditional and primary functions of stocking fish, pheasants and varying hare; of managing seven wildlife management areas and five sanctuaries; of providing all forms of public information on wildlife; of cooperating with other state, local and Federal agencies; of providing exhibits for major wildlife-oriented events; and of helping to control nuisance wildlife.

Three new projects were initiated in the Northeast District this year. The first was the incorporation of the Young Adult Conservation Corps program into District activities. Two YACC groups of one supervisor and six corpspersons were located in the District, one at District headquarters and one at the Martin Burns Wildlife Management Area in Newbury. The crew based at Newbury made a major contribution toward bringing the William Forward, Martin Burns and Crane Pond Wildlife Management Areas back on the long-range schedule of maintenance and development by creating openings, parking areas, trails and repairing roads. Significant individual projects include construction of a bridge and gate, rebuilding of the rifle range and building a 6000-foot barbed wire fence to enclose grazing cows admitted for control of vegetation. The YACC crew at District headquarters were integrated directly into Districtwide activities. Their major contribution was a fisheries survey of trout streams which included mapping of 36 streams and electrofishing 20 others. Other important work included general work at the Ayer Game Farm (including construction of a nature trail), construction of approximately 140 routed, wooden signs, and clearing openings, trails and roads on management areas. Both crews aided the salmon restoration project by manning the trap on the Merrimack River.

The second project involved the arrival of Barbara Terkanian, wildlife artist for the I & E program, funded by CETA, who used the Northeast District as home base while creating an impressive list of illustrations. These included illustrations of warm and coldwater fish species commonly found in Massachusetts, covers for the Fauna of Massachusetts Series (Massachusetts Bird List, Mammal List, etc.), programs for dedications, a display of the Charles River, and the cover of this report.

A third project was the initiation of an Urban Angler Program designed to provide new opportunities for potential anglers in urban areas. Preparations are currently underway for this project which is expected to hold a premiere workshop on 22 September, National Hunting and Fishing Day.

District personnel stocked 6244 pheasants (another 550 were released through the sportsmen's rearing program), 114 varying hare and 196,475 trout.

Management activities on wildlife management areas include development and maintenance of roads, trails, fences, buildings, clearings and signs; water level control and waterfowl management areas; wildlife plantings and seedings; and fertilizing and liming of fields. A controlled upland hunt was conducted at the Martin Burns Wildlife Management Area and a controlled waterfowl hunt was held on the first four days of the season on the Delaney Wildlife Management Area.

Approximately 250 permits were issued to use the target range at the Martin Burns Wildlife Management Area, and 350 Scouts, school children and other individuals camped "wilderness style" on various management areas.

On a regional basis, the District staff controlled water chestnut infestations on the Sudbury-Assabet-Concord River systems and maintained 287 wood duck boxes.

All five sanctuaries were posted and bounds were marked as required.

The District and Essex County League of Sportsmen's Clubs co-sponsored the Youth Upland Training Program. Seventeen youths participated.

The District continued to operate the bass-rearing system located on the Harold Parker State Forest. Some 227 largemouth bass brood stock, 250 yearlings and 24,525 fingerlings were distributed to eight ponds.

Exhibits and individuals to man them were provided for National Hunting and Fishing Day at the Concord Rod and Gun Club, Lowell Fly Tyers Annual Show in Dracut, the Topsfield Fair in Topsfield, and the Essex Agricultural Fair in Hawthorne. We also cooperated with other Districts and Field Headquarters in the New England Sportsmen's Show in Boston and the Eastern Fishing and Outdoor Exposition in Boxborough.

District personnel attended numerous evening meetings. These included 29 County League, eight sportsmen's clubs, eight general (i.e., Watershed groups), and two Conservation Commission meetings. Formal news releases were provided to approximately 40 newspapers and three radio stations. Informal information was given to sportswriters on a regular basis. The District Manager participated in two Career Day programs and various programs for Scouts.

District staff participated in 16 nuisance beaver control operations, provided advice on nuisance animals and picked up injured, sick or trapped animals as time and manpower permitted.

Cooperative farmer programs were continued on two wildlife management areas.

The District Manager worked with the planning staff in the preparation of a fish and wildlife management plan for lands purchased by the U. S. Army Corps of Engineers for the Natural Valley Storage Project located along the Charles River. Two meetings were attended with town officials and several with sportsmen's groups.

The District Manager reviewed and commented on numerous resource impact plans and statements under Section 404 of the Federal Water Pollution Act and under Coastal Wetlands Acts.

We also cooperated with Field Headquarters personnel on 18 federally-aided research and/or management projects including woodcock census, waterfowl inventory flights, and the staffing of deer checking stations.

Southeast District

Louis S. Hambly, Jr.
District Wildlife Manager

Throughout Fiscal Year 1979, the staff of the Southeast District continued traditional management and habitat improvement programs and gathered data for a variety of fish and wildlife research projects. Among these were the stocking of 124,700 trout. During the fall of 1978, 4250 cock pheasants were stocked as preseason and inseason stockings. An additional 6055 cock pheasants were stocked on wildlife management areas at that time along with 2655 quail. During the spring of 1979, 106 cock pheasants and 140 hens were released in open covers of good pheasant habitat. Two hundred white hare were stocked in open covers and wildlife management areas during February.

Routine maintenance was practiced on all management areas. This included planting one acre of annual grain, top dressing 124 acres of perennial herbaceous cover and planting over 1250 shrubs and trees at the Myles Standish State Forest Wildlife Management Area. Division personnel and the Young Adult Conservation Corps (YACC) maintained 8.8 miles of trails on three management areas and provided repair and improvements of parking areas at six wildlife management areas. Two new parking areas were created at the Erwin S. Wilder Management Area in Taunton. Thirteen parking areas were created at the Rocky Gutter Management Area by YACC personnel.

Five management areas required repairs of gates and/or fences, while signs were erected at seven areas. Division personnel and YACC personnel thinned trees and brush on three management areas. Maintenance of buildings and structures during this period involved repairs to two buildings on the Crane Wildlife Management Area, destruction and cleanup of a building on the Wilder Management Area, and adjustments and repairs to the main dam and emergency spillway at the West Meadows Wildlife Management Area.

Other activities on the management areas included setting up the Crane area for field trials, a horse show and group camping, as well as participation in a program to assist in acquisition of other lands for wildlife. The turkey farm was plowed, raked and old wire was pulled out of fence rows in preparation for the festivities conducted at the dedication ceremony to re-name that 450-acre section of the Hockomock Swamp to the Erwin S. Wilder Wildlife Management Area.

In the course of aiding other sections of this agency and other agencies in research projects, biologists from the Southeast District constructed, maintained and checked wood duck nesting boxes. New boxes were built and installed at four management areas. Nesting boxes for bluebirds were erected and maintained at two wildlife management areas.

Assisting in another Division study, District personnel collected duck gizzards for a study on the amounts and effects of lead ingested by waterfowl. Additional research on waterfowl was carried out by the U. S. Fish and Wildlife Service and Division personnel aided their data-gathering process by capturing and banding a total of 1198 ducks along the coastline. More local research involved personnel in running three routes to take a census of woodcock and four routes to take a mourning dove census.

Staff of the Fisheries section was heavily involved in conducting a survey on selected ponds to determine species composition and growth and to determine the productivity of the ponds. Periodic pH checks were carried out on the trout ponds in the Southeast District to determine which ponds were being severely affected by acid rainfall.

In an effort to provide biological control of less desirable fish species, smallmouth bass were salvaged from closed waters and transferred to selected trout ponds containing suitable habitat for the bass.

Smelt were monitored in one of the reclaimed trout ponds to determine if the population was self-sustaining.

Fisheries personnel assisted in Division research on tire reefs at Great Herring Pond, Plymouth, on the enhancement of conditions for sea-run brown trout, and on the stocking of Northern pike in warm-water ponds with suitable habitats.

Technical assistance was provided to the general public in many forms as personnel from the Southeast District investigated fish kills, operated four deer checking stations, two of which were biological stations, investigated a beaver complaint and tagged seven beaver, seven otter, and two bobcat pelts. Specific technical assistance was also provided to the Marine Biology Laboratories of Woods Hole, sportsmen's clubs, conservation commissions, planning groups, and other groups and individuals who called to request technical assistance.

In addition to these activities, District personnel continued regular maintenance of vehicles, buildings and equipment, and policed the Division's properties. Division personnel also provided many interesting and important work experiences in both fisheries and wildlife for YACC personnel.

INFORMATION & EDUCATION

Ellie Horwitz
Chief of Information and Education

To meet its mandate of disseminating information about wildlife and about sporting opportunites, the Information and Education office responds to more than 10,000 inquiries a year. Some of the requests can be answered by mailing a map or a publication, but many others require a specific, personal response. Letter writing is probably the section's most time-consuming task.

To assist in answering inquiries and to keep sportsmen throughout the state abreast of regulations, news, and opportunities, the section prepares, updates, and distributes a variety of regular publications. Among these are the abstracts of fish and wildlife regulations, abstracts of migratory bird regulations, abstracts of the Fox-Bartley firearms law, spring and fall trout stocking lists, a listing of best bass ponds, listings of checking stations for freshwater sportfishing awards and for the tagging of deer. The section also maintains maps of 200 popular fishing waters and over 45 wildlife management areas.

During Fiscal Year 1979, the section also issued a number of other publications. Included among these are revised editions of the popular Quabbin Guide and a reprinting of the Division flyer. A series of listings was initiated on the fauna of Massachusetts. To date, publications have been issued on the Birds of Massachusetts, Species for Special Consideration, and Mammals of Massachusetts. A second series was inaugurated with flyers available on the local history and natural history of beaver, wild turkeys, yellow perch and wood ducks. A commercially-printed guide to the Division's 12 wildlife sanctuaries, prepared and illustrated by CETA-funded employee, Marilyn Komins, was also published.

Additional printing tasks involved the section in obtaining materials for the support of Division activities; e.g., signs, decals, shoulder patches, business cards, and programs for the dedication of the Erwin S. Wilder Wildlife Management Area.

In addition to responding to direct inquiries, the section maintains communications with many writers and other representatives of the press, radio and television. During 1978-1979, the section issued 15 press packages comprising 129 news items. These are also routinely sent to conservation-related organizations and license sales outlets. During this period, the section also issued 12 "Tips to Outdoor Writers" (15 items), a series which speeds especially timely news to active writers. This year, the "Tips" included notices of such topics as pike stocking, results of the antlerless deer permit drawing, and an oil slick problem.

As the mailing list for press releases continues to increase, renewal coupons were sent out enabling the Division to reduce its mailing list and, at the same time, update names and addresses on the press list. An update of the organizations list is planned for 1979-1980.

As in the past, the section provided an added service to outdoor writers in the form of a deer week "hot line" which provided information on the deer harvest from telephone reports.

The series of Wildlife Portraits continued with natural history articles and photographs prepared by Peter Mirick and Sharon Dean, issued biweekly to more than 20 news outlets.

Additional articles were provided by the Information and Education staff as features for the Beacon Publications chain (three wildlife articles) and for the Outdoor Message (six articles).

The section's primary publication, Massachusetts Wildlife, edited by Jack Clancy, was issued six times during the year. Circulation has grown to more than 37,000 and plans are underway to reduce circulation by use of a renewal coupon in a future issue. Further study was accorded possible changes in format such as going to 32 pages and possibly adding color in the centerfold. No action has been taken on this.

The audio-visual arts staff completed work on two wildlife films, a 35-minute film on Massachusetts Wildlife and a 45-minute film on Division activities. The bulk of the photographers' efforts, however, were devoted to using all possible photo opportunities to increase the Division's file of black and white and color photographs. The photographers provided materials for Massachusetts Wildlife and to meet other inhouse needs for documentation and illustration. Transparencies and 8x10 black and white prints were provided to more than 30 newspapers and additional photographic prints were produced and exhibited at a variety of shows.

While photo exhibits sufficed for smaller exhibitions, more was required for large shows. The Information and Education section, through its photographic staff, was heavily involved in designing, creating and producing an impressive display on beavers in Massachusetts which was highlighted at the Eastern States Exposition in Springfield, the Western Sportsmen's Show in Springfield, the New England Sportsmen's Show in Boston and the Eastern Fishing and Outdoor Exposition in Boxborough.

Film produced by the section was provided for 20 television shows, and section personnel participated in nine television shows including Boston's Channels 4, 5 and 7 and Worcester's Channel 27. When not personally involved in radio and television shows, the section made arrangements for guest appearances of appropriate members of the research and district staff. In addition to participating in radio and television shows, section personnel presented more than 50 programs to Scouts, school groups, civic groups and career education workshops.

For the past 15 years, the Division has co-sponsored the Massachusetts Freshwater Sportfishing Awards program with the Department of Commerce and Development. This year, two categories, carp and white catfish, were added bringing the total number of categories to 19. Publicity is issued regularly for the program which provides a bronze pin to anyone submitting a qualifying entry, and a gold pin and plaque to the angler taking the largest fish in each category. Presentation of the awards is made at the New England Sportsmen's Show.

The section also continued its sponsorship of the competition for the Massachusetts migratory bird hunting stamp. In the 1978 contest (for the 1979 stamp), artist Randy Julius of East Bridgewater won top honors for his painting of a ruddy turnstone decoy. The painting was subsequently reproduced on stamps and distributed to license sales outlets as was the archery stamp commissioned from Massachusetts artist, Gordon Morrison.

With art of impressive quality on Massachusetts stamps, attention was turned to the artistic quality of other Division publications. The appearance of even inexpensive publicationshas been greatly improved by the addition to the staff of two wildlife artists, Barbara Terkanian, funded through the CETA program, and Tim Messier, funded through YACC.

Other section activities included preparation of two radio spot packages, a four-spot package dealing with fall fishing, and a six-spot package dealing with spring fishing opportunities.

The section also coordinated a joint conference of this Division with the Division of Marine Fisheries which was held for a day of sharing projects and problems of interest to both agencies.

As in the past, the Division continued to play an active role in the administration and operation of the Massachusetts Junior Conservation Camp, co-sponsored by the Division, the Department of Environmental Affairs, and the fund for the preservation of wildlife and natural areas. Camperships were solicited, campers were enrolled and Division personnel led sessions in wildlife management, fisheries management, and pond and stream ecology. At the conclusion of the two-week session, the section administered an examination and subsequently participated in the graduation of successful campers. On a smaller scale, the Division was also involved with the Marlboro Conservation Camp, but this was in a teaching capacity only.

Additional efforts were made toward establishing sportsmen-taught adult education workshops. After a series of meetings with the Division of Continuing Education and the Extension Service, the program was revised and a prototype workshop series is planned for fall in Winchendon. Other educational activities involved section personnel in assisting in preparation for an urban angler program to be initiated in the fall of 1979.

Realty

Floyd Richardson
Chief of Wildlife Lands

Introduction

The reduction of acquisition funds drastically curtailed the purchase of wildlife lands during this fiscal period. However, an additional 1097.4 acres of wildlife lands were acquired. Nine existing wildlife management areas were improved by these purchases. Each parcel purchased met a definite need of the contiguous management area. Road frontage, interior holdings, peripheral parcels, access and stream frontage were the important contributions realized with the acquisition of these lands.

Bolton Flats Acquisition Project, 655.1 acres

Sportsmen have enthusiastically supported this project. The popularity of the Bolton Flats Wildlife Management Area has increased steadily. The development of a compatible "farmer-cooperative" program and the efforts expended by District personnel are transforming this fertile valley into a wildlife management area second to none.

Two new acquisitions provided an additional 34-1/2 acres. Road frontage on Route 110 plus a large paved parking area were realized with these newly-acquired lands.

Rocky Gutter Acquisition Project, 2954.8 acres

Three acquisitions were consummated to enlarge and further protect this area. One hundred seventy-eight additional acres consisting of woodlands and wetlands complement the area by affording additional road frontage and access.

Hockomock Acquisition Project, 4782.7 acres

The "Hock" is the largest, single management area in ownership of the Division. The safeguarding of this outstanding inland wetland has become a reality with the numerous acquisitions since the inception of the project.

Two additional acquisitions provided lands in the Town of Easton and the Town of West Bridgewater to increase the total acreage to 4782.7 acres.

Chalet Acquisition Project, 723.0 acres

Excellent deer, hare and grouse habitat was acquired with the purchase of 208 acres in the Towns of Windsor and Dalton. These newly-acquired lands join the existing 515 acres to provide a promising upland wildlife management area.

Housatonic River Acquisition Project, 661.7 acres

An important segment was added to this wildlife management area with the purchase of 49 acres in the Town of Lenox. The parcel has one-half mile of road frontage and its acquisition prevents the encroachment of single and multiple-dwelling residences. Three thousand-foot stretch of river frontage was also obtained by this acquisition.

Quaboag Wildlife Acquisition Project, 1036.4 acres

The objective of this project was to enhance the existing wildlife management area and to protect the Quaboag River from encroachment. This river is well known for its warmwater fisheries. The successful introduction of Northern pike has increased the popularity of this valuable area.

A gift of 14 acres was received by the Division from Mr. John Richardson, providing river frontage and parking on Route 148. The Division purchased 172 acres along the river. Some of these lands provide not only additional river frontage, but contribute valuable road frontage as well.

Phillipston Wildlife Acquisition Project, 2012.7 acres

The proximity of this wildlife management area to Worcester, Fitchburg and Gardner, and its accessibility has brought it considerable public use. Excellent habitat resulting from past lumbering operations harbors game species such as deer, rabbits, woodcock and grouse.

The newly-acquired parcel of 147 acres is located on the northwest side of the management area. Additional access via a 100-foot strip of land adjacent to Queen Lake Road (Route 101) is also a part of the purchase.

Crane Pond Acquisition Project, 2101.0 acres

The nucleus of this management area was purchased from the Department of the Interior, through the U. S. Fish and Wildlife Service, in the late 1950s. Subsequently, abutting parcels which have become available were purchased to enlarge and enhance this area.

Two parcels fronting Forest Street in Newbury and containing slightly less than five acres were acquired. This acquisition prevents the construction of two residences which would have eliminated 40 acres of huntable land.

Birch Hill Acquisition Project, 3027.1

A 230-acre parcel was presented to the Division as a gift from Mrs. Theodora Adams. This valuable land connects with a section of land previously given by the same donor and consisting of 200 acres. The donated land will provide sportsmen with exceptional deer, grouse and hare hunting opportunities.

Summary of Land Acquisitions

Fiscal Year 1979

Area Name	Town		Acreage
Bolton Flats	Lancaster		21.50
	Bolton		13.00
Rocky Gutter	Middleboro		178.00
Chalet	Windsor		168.10
	Dalton		39.90
Hockomock	Easton		48.36
	West Bridgewater		11.20
Housatonic	Lenox		49.00
Quaboag	Brookfield		186.00
Phillipston	Phillipston		147.00
Crane Pond	Newbury		4.70
Birch Hill	Royalston		230.65
		Totals	1097.41

T. MESSIER

Maintenance & Development

John P. Sheppard
Chief, Maintenance and Development

Field Headquarters, Westboro

A new visitor parking area has been constructed at the Field Headquarters. Interior renovations continued on the headquarters building. During this period, improvements included electrical work and additions to the existing heating system. In addition, a new paging system was installed.

Hatcheries

The fuel storage system at the Sandwich hatchery has been modernized and its capacity increased. Security fencing has also been installed at this facility.

The existing water supply reservoir at the Palmer Experimental Salmon Hatchery was cleaned during the past year and work has begun on a 150 ft. by 75 ft. roof structure to cover the existing salmon-rearing ponds.

Game Farms

A new fuel storage system has been installed at the Ayer Game Farm and the paving of existing roads and parking areas was completed.

Districts

The existing driveways at the Northeast Wildlife District Headquarters building in Acton have been paved.

In the Southeast Wildlife District, a new fuel pump was installed at the headquarters building at Buzzards Bay. Also, gravel parking areas were constructed at the Wilder Wildlife Management Area in Taunton.

A new heating system was installed and some electrical work has been completed at the residence at the Bolton Flats Wildlife Management Area in the Central Wildlife District. Also in that district, the drives at the Birch Hill Wildlife Management Area office have been paved.

A new roof was installed at the residence at the Connecticut Valley Wildlife District Headquarters complex in Belchertown.

YACC

YACC

During this fiscal year, the Division's work force was augmented by about 60 members of the Young Adult Conservation Corps, authorized under Title I of the Youth Employment and Demonstration Projects Act of 1977, and administered by Commissioner Richard E. Kendall of the Massachusetts Department of Environmental Management.

Assigned to 11 different Division installations around the state, the participants, who ranged in age from 18 to 23, took part in what has been called, "one of the best YACC programs in existence."

Under this program, the YACC crews participated in a variety of activities which included construction of buildings, bridges and roadways, renovation of existing facilities, handling calls relating to nuisance animals, participating in biological projects, conducting creel surveys, thinning tree stands, thus providing openings for wildlife and/or firewood for Division installations, participating in the Division's stocking efforts, manufacturing conservation signs, and providing artwork, maps, and layout for a wide variety of Division publications.

The corpspersons have been integrated into almost all aspects of the Division's program and have assisted in completing many much-needed projects that would, without their participation, have had to be deferred.

Personnel Changes

Fiscal Year 1979

Retirements	Job Title	Date
R. Bicknell	Conservation Skilled Helper	10/30/78
H. Blake	Conservation Skilled Helper	07/27/78
Deceased		
Walter Kurpaska	Conservation Helper	03/12/79
Resigned		
N. Lucido	Senior Clerk/Typist	12/21/78
N. Williams	Junior Clerk/Stenographer	12/09/78
A. Charest	Junior Clerk/Typist	08/21/78
J. Hendee	Fish Culturist	01/06/79
J. Rossi	Conservation Helper	11/25/78
M. Brickley	Junior Clerk/Typist	05/26/79
M. Syslo	Conservation Helper	09/23/78
R. Solomon	Conservation Helper	11/28/78
Appointments		
N. Williams	Junior Clerk/Typist	07/30/78
E. Bennett	Conservation Helper	07/23/78
G. Moore	Conservation Helper	10/01/78
L. Majka	Conservation Helper	09/17/78
D. Kelley	Junior Clerk/Typist	07/09/78
T. Staples	Conservation Helper	09/24/78
E. Lech	Conservation Helper	09/10/78
P. Mirick	Conservation Helper	11/26/78
J. McGurn	Conservation Helper	07/30/78
J. Rozkuszka	Conservation Helper	08/27/78
R. Costello	Senior Clerk/Typist	05/13/79
B. Dobson	Junior Clerk/Typist	07/09/78
M. Brickley	Junior Clerk/Typist	04/26/79
C. Nazzaro	Junior Clerk/Typist	06/21/79
J. Nowakowski	Conservation Helper	05/27/79
M. Ciborowski	Conservation Helper	11/27/78
V. Lopez	Conservation Helper	03/26/79
Promotions		
J. Besse	Assistant Fish Culturist	04/28/79
L. Hollings	Conservation Skilled Helper	10/07/78
C. Thurlow	Wildlife Restoration Project Field Agent	09/15/78
J. Skowron	Assistant Fish Culturist	11/26/78
P. Salie	Conservation Skilled Helper	07/29/78

Promotions (Continued)	Job Title	Date
C. Zobka	Fish Culturist	04/15/79
B. Dobson	Senior Clerk/Typist	04/01/79
A. Gola	Conservation Skilled Helper	05/27/79
F. Soroco	Senior Bookkeeper	04/01/79
C. Hatch	Senior Clerk	12/27/78
S. Early	Conservation Skilled Helper	07/23/78
J. Boudreau	Assistant Game Culturist	12/10/78
W. Humberstone	Conservation Skilled Helper	11/26/78
P. Orrizzi	Conservation Skilled Helper	10/29/78
H. Dufault	Wildlife Area Supervisor	07/30/78
A. Myers	Conservation Skilled Helper	10/01/78
J. Robinson	Conservation Skilled Helper	07/30/78

The following individuals were appointed supervisors of YACC crews during Fiscal 1979. Their appointments are not included with those of the Division as, in this capacity, they are officially Maintenance and Construction Foremen of the Department of Environmental Management.

Walter Dauderis
Winston Neale
William Hearn
Carl Zobka
John Kostro
Edward Kraus
Frank Putnam
David Carlson
Robert Garabedian

Legislation

Bills affecting wildlife or of particular interest to the Division of Fisheries and Wildlife which were enacted into law during the period 1 July 1978 to 30 June 1979 are as follows:

Chapter 387

An act providing for the noncriminal disposition of certain fish and game and marine fishery violations.

Approved (signed by Governor) 12 July 1978.
Effective 10 October 1978.

Chapter 453

An act making certain corrective changes relative to the law authorizing the Commissioner of Fisheries, Wildlife and Recreational Vehicles to convey certain land in Georgetown to Joanne C. Stanley and to convey other land to William E. Handren in exchange for certain land.

Approved (signed by Governor) 17 July 1978.
Effective upon signing.

Chapter 473

An act relative to permits issued for certain aquacultural purposes.

Approved (signed by Governor) 17 July 1978.
Effective 15 October 1978.

Chapter 505

An act transferring control of certain land at Gardner State Hospital to the Executive Office of Environmental Affairs.

Approved (signed by Governor) 19 July 1978.
Effective 17 October 1978.

Chapter 506

An act authorizing the Commonwealth to take four certain tracts of land in the towns of Spencer and Leicester.

Approved (signed by Governor) 19 July 1978.
Effective 17 October 1978.

FINANCIAL REPORT

Nancy Melito
Head Administrative Assistant

Through careful management of monies received from the sale of licenses, Federal Aid reimbursement and other miscellaneous sources of income, the Division of Fisheries and Wildlife has, historically, been a self-supporting agency. All such income is deposited in the Inland Fish and Game Fund for expenditure for division operations as approved by the Legislature on a fiscal year basis.

However, as a result of rising costs caused basically by inflation and accompanying salary increments, a deficit in the amount of $292,414.00 existed at the close of business on June 30, 1978. Even with severe curtailment of expenditures in the subsequent year, and an overall increase in income of $888,662.00, the deficit in 1979 has grown to $762,241.00. The following is a report of the actual financial transactions during the 1979 fiscal year.

The section entitled "A Summary of Fish and Wildlife Income" reflects an increase of $821,578.00 in Federal Aid monies in comparison to the previous fiscal year. A considerable portion of this reimbursement was realized through the approval of various land purchases.

With the reorganization of the Court system, deposit of fines by Court personnel into the Inland Fish and Game Fund declined. During this transition period, various accounting procedures had to be resolved with the result that fines to be credited to special funds were held in a State Treasurer's account pending proper assignment.

During this fiscal year over sixty sporting good stores were authorized to sell licenses. As itemized on Detail Sheet No. 1, "Receipts from Fishing, Hunting and Trapping Licenses", there was an increase in sales of 16,901 licenses; notably, 10,120 in the resident fishing category. The convenience of these additional store outlets with extended sale hours is probably responsible to a considerable degree for this license issuance increase.

This year also reflected a sharp rise in archery hunters from 7,931 in 1978 to 9,011 in 1979. It appears that this sport is growing in popularity. Perhaps some of the contributing factors include the longer season for archery hunting, the continued improvement of our deer herd and the prohibitive cost of out-of-state licenses during this economically stressful time.

COMMONWEALTH OF MASSACHUSETTS
DIVISION OF FISHERIES AND WILDLIFE
Fiscal Year July 1, 1978 to June 30, 1979

"HOW THE SPORTSMEN'S DOLLAR WAS SPENT"

	Account No.	Expenditures	
Administration			
Administration	2310-0200	324,010.18	
Information-Education	2310-0200	202,864.44	
		526,874.62	11.95%
Fisheries Programs			
Fish Hatcheries	2310-0600	638,195.26	
**Fisheries Management	2310-0600	443,242.10	
Fisheries Cooperative Unit	2310-0600	15,000.00	
		1,096,437.36	24.87%
Wildlife Programs			
Game Farms	2310-0400	460,389.92	
**Wildlife Management	2310-0400	487,071.59	
Wildlife Cooperative Unit	2310-0400	15,000.00	
		962,461.51	21.83%
Damage by Wild Deer and Moose	2310-0800	15,455.53	.35%
Land Acquisition			
* ***Acquisition of Upland Areas and Inholding on Existing Areas	2310-0310	222,829.04	
* ***Coastal and Inland Waters Acq.	2670-9016	5,191.44	
		228,020.48	5.18%
Engineering and Construction			
*Development and Improvement of Facilities for Public Use	2310-0300	196,599.16	4.46%
Secretary, Environmental Affairs			
Office of Secretary (3%)	2000-0100	6,786.00	.15%
Department of Fisheries, Wildlife and Recreational Vehicles			
Commissioner's Office (50%)	2300-0100	45,002.00	1.02%
Department of Environmental Management			
Natural Resources Officers' Salaries and Expenses (30%)	2020-0100	405,940.00	9.20%
Hunter Safety Training (100%)	2020-0300	59,668.00	1.35%
Transfers from Fund			
Group Insurance	1590-1007	193,496.00	4.39%
Settlement of Certain Claims	1590-1006	500.00	.01%
Retirement Assessment (.2%)	0612-1000	221,262.00	5.02%
Interest on Bonded Debt	0699-2800	85,595.00	1.94%
Maturing Serial Bonds and Notes	0699-2900	365,000.00	8.28%
TOTAL EXPENDITURES		$4,409,097.66	100.00%

*Continuing Appropriation.
**Portions of expenditures 60% or 75% reimbursable by Federal Government.
***Certain land acquisitions are 50% reimbursable by Federal Government.

APPROPRIATIONS AND EXPENDITURES
Fiscal Year July 1, 1978 to June 30, 1979

ACCOUNT NO.	TITLE	APPROPRIATIONS	EXPENDITURES & LIABILITIES	TOTAL REVERSION
2310-0200	Administration	550,000.00	526,874.62	23,125.38
2310-0315	Purchase of Equipment	100,000.00	99,529.27	470.73
2310-0400*	Wildlife Management	980,000.00	962,461.51	17,538.49
2310-0600*	Fisheries Management	1,150,000.00	1,096,437.36	53,562.64
2310-0800	Damage by Wild Deer & Moose	16,500.00	15,455.53	1,044.47
		2,796,500.00	2,700,758.29	95,741.71
		CONTINUING APPROPRIATIONS	EXPENDITURES	BALANCE FORWARD
2310-0300	Development & Improvement Facilities for Public Use	292,358.18	196,599.16	95,759.02
2310-0310**	Acquisition of Upland Areas & Inholding on Existing Areas	500,633.34	222,829.04	277,804.30
2670-8753	Certain Renovations to Lyman School Building	36.03	-	36.03
2670-9016**	Acquisition of Coastal & Inland Wetlands	214,545.78	5,191.44	209,354.34
2670-9021	Pollution Abatement: McLaughlin Hatchery	60,822.56	-	60,822.56
2670-9022	Fish Screens, Quabbin	4,105.37	-	4,105.37
2670-9023	Fish Rearing Facilities (Palmer & McLaughlin)	4.51	-	4.51
		1,072,505.77	424,619.64	647,886.13

*Portions of expenditures 60% or 75% reimbursable by Federal Government.
**Certain land acquisitions are 50% reimbursable by Federal Government.

SUMMARY OF FISH AND WILDLIFE INCOME

July 1, 1978 to June 30, 1979

*Fishing, Hunting and Trapping Licenses	3304-61-01-40	$2,373,534.25
*Trap Registrations	" " " "	1,216.50
*Archery Stamps	" " " "	45,059.50
*Waterfowl Stamps	3304-40-01-40	5,691.15
*Waterfowl Stamps - Ducks Unlimited	3304-40-02-40	20,705.60
**Special Licenses, Tags and Posters		9,735.90
Antlerless Deer Permits	3304-61-14-40	9,693.00
Bear Permits	" " " "	287.00
Rents	3304-63-01-40	14,222.50
Miscellaneous Income	3304-69-99-40	620.23
Sales, Other	3304-64-99-40	3,050.95
Refunds Prior Year	3304-69-01-40	383.70
Court Fines and Penalties	3308-41-01-40	4,775.00
Pittman-Robertson Federal Aid	3304-67-01-40	866,917.47
Dingell-Johnson Federal Aid	3304-67-02-40	225,695.14
Anadromous Fish Projects Federal Aid	3304-67-04-40	32,689.34
Interest on Investments	3395-60-01-40	14,210.42
Gasoline Tax Apportionment	3312-05-01-40	317,770.00
		$3,946,257.65

Deficit in Inland Fish and Game Fund as of June 30, 1979: $762,241.00

*Detail Sheet No. 1
**Detail Sheet No. 2

Detail Sheet #1

DIVISION OF FISHERIES AND WILDLIFE
RECEIPTS FROM FISHING, HUNTING AND TRAPPING LICENSES
Fiscal Year July 1, 1978 to June 30, 1979

Type of License		Price	Quantity	Gross Amount	Fees Retained by Clerks	Net Returned to State
Series #1	Res. Cit. Fishing	8.25	125,501	1,035,383.25	29,697.00	1,005,686.25
#2	Res. Cit. Hunting	8.25	53,780	443,685.00	13,321.00	430,364.00
#3	Res. Cit. Sporting	13.50	51,590	696,465.00	12,157.00	684,308.00
#4	Res. Cit. Minor Fishing	6.25	9,352	58,450.00	2,229.25	56,220.75
#5	Res. Cit. Alien Fishing	11.25	952	10,710.00	225.00	10,485.00
#6	Non-Res. Alien Fishing and Non-Res. Cit. Fishing	14.25	3,438	48,991.50	812.00	48,179.50
#7	Non-Res. Alien and Non-Res. Cit. 7-day Fishing	8.25	1,864	15,378.00	456.00	14,922.00
#8	Non-Res. Alien and Non-Res. Cit. Small Game Hunting	20.25	828	16,767.00	199.25	16,567.75
#9	Non-Res. Alien And Non-Res. Cit. C.S.P. 3-day Small Game Hunting	16.25	126	2,047.50	12.75	2,034.75
#10	Res. Cit. Minor Trapping	6.25	471	2,943.75	116.25	2,827.50
#11	Res. Cit. Trapping	11.50	1,147	13,190.50	281.25	12,909.25
#12	Duplicates	1.00	3,596	3,596.00	-	3,596.00
#13	Res. Alien Hunting	16.25	1,255	20,393.75	252.00	20,141.75
#14	Non-Res. Alien and Non-Res. Cit. Big Game Hunting	35.25	907	31,971.75	223.75	31,748.00
#15	Res. Cit. Sporting (Over 70)	FREE	19,867			
#16	Res. Cit. Fishing (Blind, Paraplegic, Mentally Retarded)	FREE	1,120			
#17	Res. Cit. Hunting (Paraplegic)	FREE	62			
#18	Res. Cit. Fishing (Age 65-69)	4.10	4,603	18,872.30	1,129.25	17,743.05
#19	Res. Cit. Hunting (Age 65-69)	4.10	137	561.70	32.00	529.70
#20	Res. Cit. Sporting (Age 65-69)	6.75	2,308	15,579.00	561.00	15,018.00
#21	Res. Cit. Trapping (Age 65-69)	5.75	46	264.50	11.50	253.00
			282,950	2,435,250.50	61,716.25	2,373,534.25
#22	Archery Stamps	5.10	9,011	45,956.10	896.60	45,059.50
*	Trap Registrations			1,216.50	-	1,216.50
			291,961	2,482,423.10	62,612.85	2,419,810.25
#23	Waterfowl Stamps	1.25	25,759	32,198.75	5,802.00	26,396.75
			317,720	2,514,621.85	68,414.85	2,446,207.00

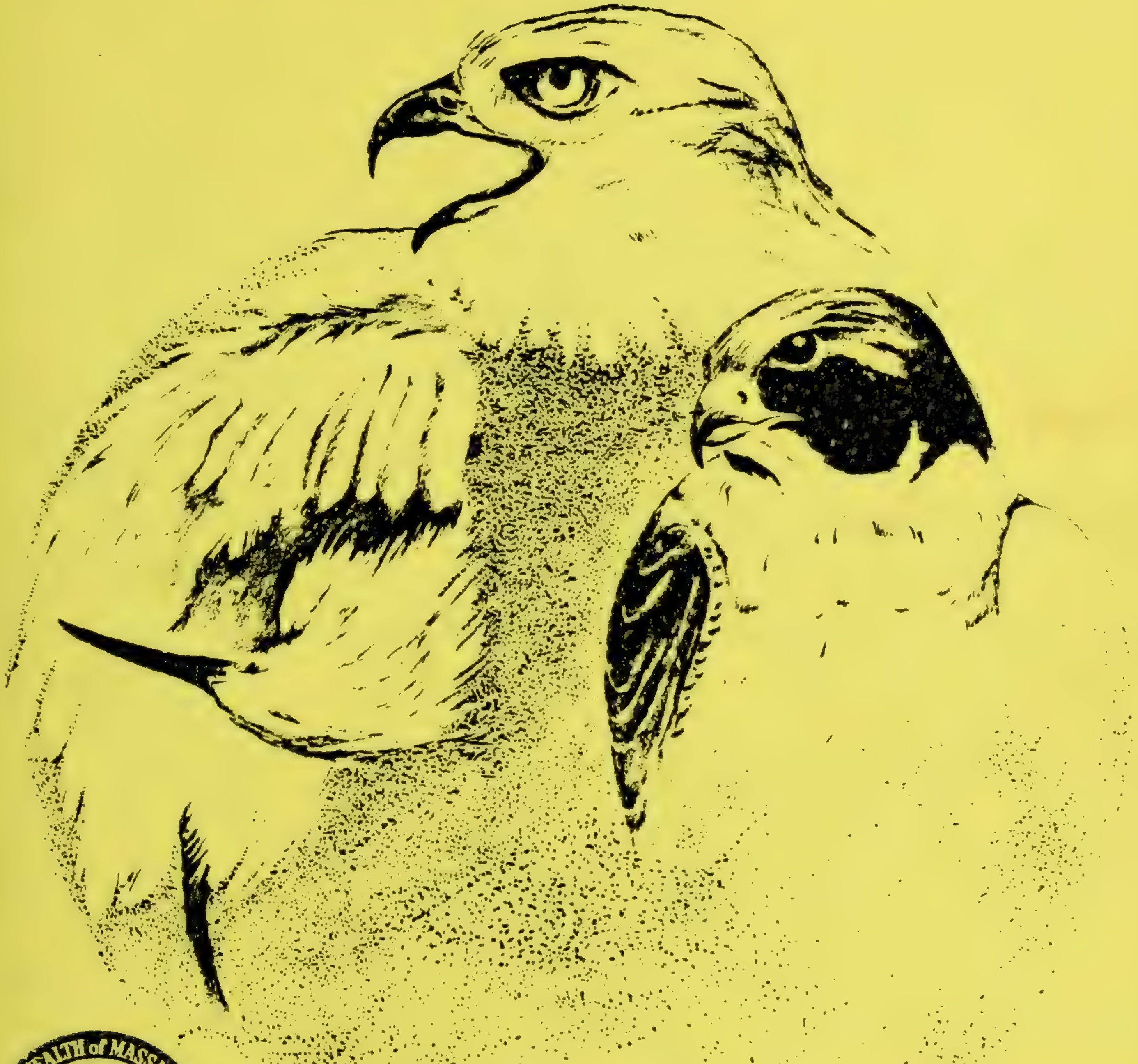
* Trap Registrations

Initial:	253 @ $2.00	$506.00
Renewal:	467 @ $1.50	700.50
Duplicates:	10 @ $1.00	10.00
		$1,216.50

SPECIAL LICENSES, TAGS AND POSTERS
July 1, 1978 to June 30, 1979

Receipt Acct.	Type of License	Quantity & Unit Price	Amount	Receipt Account Total
3304-61-02-40	Fur Buyers			
	Resident Citizens:	31 @ 15.00	465.00	
	Non-Residents or Aliens:	6 @ 50.00	300.00	765.00
3304-61-03-40	Taxidermists:	107 @ 10.00	1070.00	
		1 @ 3.00	3.00	1,073.00
3304-61-04-40	Propagators			
	Special Purpose Permits:	136 @ 1.00	136.00	
	Class 1 (Fish)			
	Initial:	18 @ 7.50	135.00	
	Renewal:	139 @ 5.00	695.00	
	Class 3 (Fish)			
	Initial:	13 @ 7.50	97.50	
	Renewal:	65 @ 5.00	325.00	
	Class 4 (Birds & Mammals)			
	Initial:	89 @ 7.50	667.50	
	Renewal:	432 @ 5.00	2,160.00	
	Class 6 (Dealers)			
	Initial:	8 @ 7.50	60.00	
	Renewal:	48 @ 5.00	240.00	
	Additional:	207 @ 1.50	310.50	
	Class 7 (Individual Bird or Mammal)			
	Initial:	7 @ 3.00	21.00	
	Renewal:	35 @ 1.00	35.00	
	Importation Permits			
	Fish	10 @ 5.00	50.00	
	Birds or Mammals	31 @ 5.00	155.00	
	Class 9 (Falconry)			
	Master:	6 @ 25.00	150.00	
	Apprentice:	7 @ 25.00	175.00	
	General:	5 @ 25.00	125.00	
	Class 10			
	Raptor Breeding:	3 @ 10.00	30.00	
	Raptor Salvage	4 @ 1.00	4.00	5,571.50
3304-61-05-40	Take Shiners:	100 @ 5.00		500.00
3304-61-06-40	Field Trial Licenses:	3 @ 15.00		45.00
3304-61-08-40	Quail to Train Dogs			
	Initial:	6 @ 7.50	45.00	
	Renewal:	29 @ 5.00	145.00	190.00
3304-61-10-40	Commercial Shooting Preserves:	8 @ 25.00		400.00
3304-61-12-40	Mounting Permits:	9 @ 2.00		18.00
3304-61-13-40	Special Field Trial Permits:	37 @ 15.00		555.00
3304-64-01-40	Game Tags:	7,298 @ .05	364.90	
	Fish Tags:	12,500 @ .02	250.00	
	Posters:	70 @ .05	3.50	618.40
				$9,735.90

MASSACHUSETTS DIVISION OF FISHERIES AND WILDLIFE



ANNUAL REPORT
1980 & 1981

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The Commonwealth of Massachusetts
Division of Fisheries and Wildlife
Leverett Saltonstall Building, Government Center
100 Cambridge Street, Boston 02202

DIRECTOR

His Excellency, Edward J. King, Governor of the Commonwealth, the Executive Council, the General Court, and the Board of the Division of Fisheries and Wildlife.

Sirs:

I have the honor to submit herewith the One Hundred Fifteenth and One Hundred Sixteenth Annual Reports of the Division of Fisheries and Wildlife, covering the fiscal years from 1 July 1979 to 30 June 1980 and 1 July 1980 to 30 June 1981.

Respectfully submitted,

Richard Cronin

Richard Cronin
Director

Publication No. 12864-100-62-7-82-C.R.

Approved by John Manton, State Purchasing Agent

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The Board Reports

Bradlee E. Gage
Chairman

The administrative Board of the Division of Fisheries and Wildlife met on a monthly basis throughout the year and followed its practice of moving the meetings around the state--from the Berkshires to Cape Cod--not only to familiarize Board members with the Division's many facilities but also to make it possible for interested citizens from all parts of the Commonwealth to take part in and attend Board meetings.

Personnel

With the resignation in June 1979 of Director Matt Connolly, Jr., the Board began searching for a replacement. It was decided early in the process to seek a replacement director within the Division rather than look afield. In July 1980, the Board selected Richard Cronin as director noting that his extensive experience with the Division would serve the state, the sportsmen, and the resource well.

While many personnel changes were made in the Division, two in particular, required approval by the Board. Carl Prescott was appointed Superintendent of the Bureau of Wildlife Research and Management, and Bradford G. Blodget was appointed Assistant Director of Nongame and Endangered Species.

Fiscal 1981 brought three changes on the Board itself brought about by the departure of James Baird, Donald Coughlin and Philip Stanton. The Board and the Commonwealth were fortunate to have the services of these three members during the adoption of nongame regulations and during the establishment of the nongame program. They were replaced by Jack Sylvia, Richard Kleber and Colton H. Bridges who have quickly joined in to continue the work of the Board.

With notice that the Board was responsible for all Division personnel actions, a personnel report was made part of the monthly agenda.

Hearings

A major part of Board work continues to be in the area of regulatory changes. During fiscal year 1980, a number of the changes made were simply housekeeping items which related to changes in language or to other non-controversial matters. Others, more controversial, or more far reaching are worthy of special note. During FY80, three hearings stood out. The annual waterfowl hearing was, as always, well attended. After considerable testimony, the Board voted an experimental three-segment split season hoping that such a season would offer the best combination for both coastal and inland gunners; early and late gunners.

Another key hearing dealt with an experimental bearded "gobbler" season limited by weapons, areas, and issuance of a limited number of permits. This season was extremely successful and raises hopes of even better seasons in the future.

Nongame management was the focus of another well-attended hearing which dealt with setting of regulations, long overdue, for dealing with endangered species, wildlife and plants as well as the setting of regulations for propagation and maintenance of wildlife in captivity.

Other hearings and ensuing Board decisions dealt with changes in deer hunting hours, taking of sea-run trout, legal size limits for bass and pickerel, mandatory return of carcasses of bobcats and changes in date for the special deer hunt for paraplegic sportsmen.

Fiscal Year 1981 saw its share of controversial hearings, too. After two public hearings, one in the eastern part of the state and the other in the western part, the Board initiated a limited hunting season on coyotes. Besides the unprecedented double hearing aimed to allow everyone every possible opportunity to comment, the Board considered many technical reports and an unusually large volume of mail.

The waterfowl hearing was, as always, difficult due to the conflicting needs and hopes of coastal versus inland hunters and of those who prefer to hunt early or late. An additional problem was raised this year by a Federal prohibition of lead shot in certain areas. While this was not generally well accepted by waterfowl hunters, the Board felt the need to support United States Fish and Wildlife Service guidelines while continuing to gather local data as best possible.

There were, of course, also housekeeping items and the Board decided that in the event that changes proposed are of a minor and non-controversial nature, hearings could be held as part of the regular monthly meeting.

Other Activities

In its role as overseer of Division activities, the Board participated in an ongoing review of Division activities, reviewed all personnel actions, and considered possible new programs as well as potential or existing problem areas. Programs such as the introduction of tiger muskies or grass carp, use of Division facilities, for example, Penikese Island, formation of a nongame advisory committee and, of course, finances were discussed in detail. The Board appreciates the continued cooperation of the Director and his staff in making the monthly meetings productive.

Concerns

As in previous reports, the main concern is, unquestionably, the Division's finances. The Board, the Division and the sportsmen still want, very much, to "pay their own way" and to operate within their own resources. Considering the tightness of General Court monies, and the fact that under such a regimen funds for the Division would undoubtedly be meager, this is probably the only practical approach. It does mean, however, that with increasing costs, close control must be maintained over expenses while doing all possible to maximize revenues. The Board understands that in order to maintain financial independence, it may be necessary to cut back slightly on some programs. It should be noted, however, that by allowing more flexibility in management within the Division, the Board has encouraged many programs to become more cost effective. Despite belt tightening, however, it appears that the cost of permits and licenses will have to be raised to maintain the status quo. It is hoped that any increase will not be such as to reduce participation by the Commonwealth's sportsmen.

A second concern deals with funding of nongame programs. At the present time, the Division is, rightfully, involved with nongame management. During the past years, meaningful regulations have been established to deal with nongame species. To carry out its mandate in the nongame area, the Division needs a source of nongame funds as sportsmen's license fees are limited and cannot be stretched to cover current programs as well as expanded nongame programs.

Brief mention should be made again, in closing, of the need to raise salary levels of the Division's professional staff. During 1980 and 1981, several key people moved to similar work in other agencies at much higher levels of pay.

Summary

The Board feels that the Division is performing in an efficient manner under, often, very trying conditions. There is a high degree of professional competence. With continued support from the sportsmen, the general public, the legislature, and other state agencies, the Division will continue to move ahead.

Planning

Paul S. Mugford
Senior Land Use Planner

During Fiscal Year 1980, the planning team continued to work with the Division's senior staff toward the development of a comprehensive fish and wildlife management plan. This planning effort will increase agency effectiveness. The costs of the planning project itself are 75 percent Federally reimbursable.

The project involves setting an objective for each program that is, insofar as possible, subject to measurement or evaluation. Annual review will allow comparison of achievements to a project's initial objectives. It is divided into three phases: Strategic Planning, Operational Planning (implementation) and Performance Control and Evaluation.

Preliminary to providing overall program direction, the following goal statement was developed and adopted by the senior staff:

> "In recognition of the ecological, recreational, scientific, educational, and commercial values of wildlife and in consideration of the complexities of human/wildlife interactions having occasional negative impacts on man's interests, it shall be the goal of the Division of Fisheries and Wildlife to perpetuate and enhance the wildlife resources of the Commonwealth to the extent practicable, by the intelligent application of sound management techniques. Implicit in this effort is the necessity to manage for the long-term benefit of the wildlife population as a whole and not for the short-term benefit of individual animals."

An agency program structure was selected that would focus on specific fish and wildlife species or, in some cases, species groups. For each species appropriate information has been assembled or targetted for acquisition. In order to update existing records, the planners, assisted by other staff members, completed a telephone survey of 4,000 licensed anglers and obtained statistics on harvests, species preference, and waters fished. This data, along with similar data obtained from small game and trapping harvest surveys was analyzed, categorized and stored in the University of Massachusetts computer bank for future use. Immediate access to this information is available via a terminal which, since January 1980, has been in use at the Westborough Field Headquarters.

Major accomplishments of the planning project during Fiscal 1981 were: the design and implementation of a new cost accounting system; development of measurable program objectives and strategic management plans for several selected species; continued analysis of fisheries and wildlife user supply/demand data; and near completion of the stream inventory system which will provide a quantified directory of all named streams in the Commonwealth.

As strategic plans near completion, the Division staff can begin to develop five-year operational work plans. In order to assist staff members charged with the responsibility of drawing up operational plans, the planning staff has drafted an operational handbook which will facilitate development of work proposals.

Finally, in compliance with Federal planning standards and NEPA regulations, the Division solicited public review and comment on its proposed program structure. Copies of the announcement were sent to selected groups and individuals and the "Environmental Monitor" published by the Massachusetts Executive Office of Environmental Affairs. The request was for anyone to submit "concerns and proposals relating to those problems, issues, and needs that they believe should be considered." A sole response was received.

FISHERIES

Peter Oatis
Chief Aquatic Biologist

Anadromous Fish Management

The dedication of the Turners Falls fishway on the Connecticut River highlighted the fisheries activity for 1980. The activation of this facility marks the first time since 1897 that anadromous species such as shad and salmon have had access to the river above the falls and into Vermont and New Hampshire waters. With the completion of the fishway in Vernon, Vermont, later this year, the 1981 run of shad will have free access throughout their historic range on the Connecticut River. At the Holyoke, Massachusetts fishway, activity was brisk, a new record of approximately 390,000 adult shad were passed and 120 adult salmon were captured and shipped to state and Federal hatcheries for brood stock purposes. In all, 160 adult salmon were accounted for, including those found dead, the sport catch, etc. Clearly, the money and manpower expended on this project are beginning to return healthy dividends.

With the dedication in 1981 of the new fishway at the New England Power Company's dam in Vernon, Vermont, American shad gained complete access to their historic spawning and nursery grounds in the Connecticut River. Within a few generations, most of this habitat will be occupied and there will be a significant increase in the population. The spring run of Atlantic salmon was the best in nearly two hundred years. As of October 1981, 516 adult fish have been accounted for, the great majority of them presently reside in selected state and Federal hatcheries throughout the basin. The projected egg production may well exceed one million and should definitely put the development of a true Connecticut River strain of salmon on a solid basis.

The passage at Holyoke was again the most active fishway on the river. In all, 375,000 shad, 319 salmon, 400,000 blueback herring, 53,000 lamprey and 400 striped bass passed through and, with the exception of salmon taken to hatcheries, continued their passage upriver.

Additional progress was made on the Merrimack River. The Lawrence hydroelectric project at the Essex Dam, started in 1980, was nearly completed and is scheduled to become operational in late summer of 1982 in time for the 1982 shad and salmon run. Besides opening up an additional twelve miles of shad habitat, this fish passage will serve as the trapping location for salmon whose progeny will form the basis for establishing a Merrimack River strain and will provide the first accurate assessment of the size of existing anadromous runs.

The emergency regulation closing the Connecticut and Merrimack Rivers to salmon fishing passed this spring to avert a potential overharvest of salmon brood stock, was later deemed unnecessary. Henceforth, angling for salmon on these rivers will be permitted year-round in Massachusetts. The daily creel limit has, however, been lowered from two to one salmon per day and the minimum length remains at 15 inches. Smolt stocking totalled 77,000 and 100,000 for the Connecticut and Merrimack Rivers respectively during the spring of 1981. Three-year operational plans for salmon and shad restoration in the Merrimack and Connecticut Basin were completed and are now available for public inspection.

Attempts to hasten restoration of shad via the stocking of gravid adults into available spawning habitat were undertaken on the Merrimack, Charles and Taunton Rivers by trucking in suitable fish from the Holyoke fishway.

Lake Management

The information provided by numerous biological surveys of lakes and ponds prompted the Fisheries and Wildlife Board to establish new minimum length restrictions on black bass and chain pickerel. As of 1 January 1981 bass must be 12 inches and pickerel 15 inches long before they can be harvested. Information relative to the existing exploitation of bass in selected lakes and ponds is being assessed through the joint efforts of Division biologists working in cooperation with the Massachusetts Bass Federation on a bass tag return and reward program.

Fifty lakes were surveyed by fisheries crews to assess fish population abundance, diversity, growth, water quality and lake accessibility. Recommendations were developed in accordance with fisheries objectives and existing manpower and fiscal limitations.

Forage was enhanced for trout by releasing smelt at Asnacomet Pond, Hubbardston; Cliff Pond, Brewster; Spectacle Pond, Lancaster; and Lake Mattawa, Orange. Landlocked alewives were transported from Lake Congamond, Southwick, to Lake Singletary, in Sutton, in an effort to encourage the growth of black bass and yellow perch.

Following recommendations stemming from the 1980 survey, attempts to improve pan and gamefish populations via prey and predator stockings were initiated at selected lakes.

The esocid (pickerel, pike, etc.) management program was finally put on a sound bais. No longer will we be dependent upon occasionally available supplies of northern pike purchased from a Minnesota dealer. Instead, plans were made to introduce tiger muskie to selected waters. This species lends itself to hatchery culture on an economical basis and will, hopefully, place the management of our large esocid fisheries on an even keel with a consistent supply. Additional benefits should accrue through much-needed predation on stunted panfish populations.

The Pennsylvania Fish Commission graciously gave Massachusetts 10,000 tiger muskie fingerlings in September of 1980. These hybrids, which result from crossing northern pike with muskellunge have the growth potential of both species and the appetite to match. They should thin out many poorly-growing, overpopulated pan and rough fish populations and provide some excellent angling within the next few years. Pennsylvania also supplied an additional 100,000 tiger muskie fry during the spring of 1981. These fish have been growing well at the Roger J. Reed Hatchery and will be released in the fall. By 1982, the following waters will have received initial or secondary stockings of tiger muskie: Buffumville Reservoir, Lake Manchaug, Webster Lake, Flint Pond, Massapoag Pond, Otis Reservoir, Pontoosuc Lake, Cook Pond, Lake Nippenicket, Spy Pond, Lake Cochituate, Bassetts Pond, Plainfield Pond, Thousand Acre Swamp, Connecticut River Oxbow, East Brimfield Reservoir, Red Bridge (Chicopee River), Quaboag Pond, Dark Brook Reservoir, Indian Lake, Lake Pearl, and Whitehall Reservoir.

It is expected that some of the fish released in the fall of 1980 will attain the minimum legal length of 28 inches during the 1982 fishing season.

During 1980, the Quabbin fishery enjoyed the best year on record as far as lake trout and smallmouth bass fishing were concerned. Maintenance of the water at near-spillway level for the past five years has contributed significantly to the successful spawning and production of these favored game species. Despite the increases in trout and bass populations, the smelt forage base responded positively to the increase in water storage. A new state record for lake trout was set at 20 pounds 12 ounces on 14 June.

Adequate shore and boat access continues to be a problem at many lakes while excessive weed growth impairs the use of many additional acres of potentially fishable water. Funding for new access sites must be given a higher priority and additional funds must be obtained to maintain existing access sites. This Division must also commit itself to taking the lead in investigating inexpensive methods of controlling large areas of aquatic weeds on a cost-effective basis. The use of the white amur is one control method which holds some potential, but it needs Board approval before it can be tried.

Many of Massachusetts' well-known trout ponds are beginning to show signs of increasing acidity. Kettle ponds such as Higgins, Shubael, Pimlico, Mary's and Fearing's desperately need to be treated with limestone if they are to maintain their fishery potential. Numerous other waters including Quabbin Reservoir are in jeopardy due to acid rainfall. Loss of fish habitat in the Quabbin alone could mean a loss of 13 percent of the total inland water acreage presently open to angling. This year, Quabbin produced at least 8,300 legal lake trout including a new state record of 20 pounds 12 ounces, not to mention thousands of smallmouth bass and rainbow trout and hundreds of landlocked salmon. It is a fishery to be guarded with care.

Stream Management

A total of 186 streams were surveyed , 80 in 1980 and 106 in 1981, to assess their potential for supporting trout, angling use and water quality. All information is presently being computerized. This information will greatly influence future regulations and stocking practices designed to increase angling benefits without increasing costs.

Brood stock collection for sea-run brown trout was about average during both years. Protection for the young fish was inaugurated in 1981 when the Fisheries and Wildlife Board voted to close the lower reaches of five sea-run brown trout streams from 15 March to 31 May each year and to reduce the creel limit from six per day to 2. By the spring of 1982, the sea-run brown fry and fingerlings should have new quarters at the East Sandwich hatchery.

The Quashnet River restoration project continued with Trout Unlimited volunteers contributing at least 12,000 man hours, removing one third of a mile of brush in and along the stream bed. They also installed numerous overhead and wing deflector cover devices to increase the stream's trout holding capacity.

During 1981, the Division embarked upon its first commercial eel season. Presently, only fifteen licenses are issued and vital statistics on eels taken are being collected and analyzed to determine the future of this fishery.

Technical Assistance

The need to consider alternatives to imported oil has stimulated the development of both new and abandoned hydroelectric projects. The impact of such projects on fisheries habitat are presently being examined and resolutions to potential problems are being resolved as a pre-requisite to licensing. Additional fish surveys are being conducted in conjunction with the Department of Environmental Quality Engineering to determine levels of toxicants in fish flesh and the effect of chlorinated effluent from sewage treatment on fish populations.

Numerous fisheries programs are now functioning on the Division's new computer. These programs are easing the duties of biologists who formerly spent many winter months processing and analyzing data that had been collected during the spring and summer. These new computer services have freed staff members to investigate more areas with greater accuracy than previously.

Urban Angler

Under the direction of Ilo Howard, numerous volunteers, donations from tackle manufacturers, retail outlets, recreation and conservation commissions and government agencies were coordinated to bring fishing information and know-how to over 800 inner city residents. A total of 22 clinics were held introducing old and young anglers to fishing methods, cleaning and cooking the catch, and where to go in the immediate vicinity of their homes. Response is favorable and demand for additional clinics is high.

HATCHERIES

David Fredenburgh
Chief Fish Culturist

With the advantages of full staffing and development funding, the hatcheries experienced good years in 1980 and 1981. Overall, production remained excellent and even set a record during 1981 when the Division stocked 1,290,775 trout weighing a total of 475,849 pounds. Not only were there many fish, but they were of very high quality.

During 1980, the Palmer Salmon Hatchery (rededicated as the Roger Reed Salmon Hatchery) received 29 adult Atlantic salmon from the Connecticut River. These fish were in good shape compared to fish brought in in previous years. New techniques of handling and treating returning fish at Federal and state salmon hatcheries appear to be the major factors contributing toward increased quality and survival. Unfortunately, the program at this hatchery suffered a severe setback on Labor Day 1980 when the salmon were lost because of a water pump failure and a coincidental failure of the alarm system. Modifications were made in both water and alarm systems to ensure that this will not happen again.

Construction on a new coho rearing unit at the East Sandwich hatchery came to a standstill in 1980 because of the necessity of filing for permits with the local historical commission. Design was completed, however, and the project was reactivated during the spring and summer of 1981 as contracts were awarded for the water system, the hatch house, a pool cover, and chainlink fence.

In March of 1981, the Division received word of a $50,000 appropriation to build a tiger muskie (northern pike x muskellunge) hatchery. These fish have been used extensively in New York and Pennsylvania as a management tool to control pan and rough fish and they are also excellent game fish. The Roger Reed Salmon Hatchery at Palmer was selected as the site for rearing the tiger muskies primarily because of the reservoir/well system which allows temparture control. Contracts were put out on five thirty-foot long fiberglass tanks and on automatic feeders. During May of that year, 50,000 newly-hatched "tigers" were received from Pennsylvania and by 30 June 1981, they were at the Reed hatchery and thriving.

Although not singled out for comment, the other hatcheries--McLaughlin, Bitzer and Sunderland--continued a high level of production and contributed materially to the success of the hatchery program.

FISH PRODUCTION

	1979-1980 No. Stocked	Weight (lbs.)	1980-1981 No. Stocked	Weight (lbs.)
McLaughlin				
Rainbow Trout	254,868	204,720	229,157	112,384
Brook Trout	146,697	35,036	168,833	55,901
Brown Trout	92,000	19,915	145,751	38,229
Totals	493,565	259,671	543,741	206,514
Montague				
Rainbow Trout	37,250	30,859	61,800	61,341
Brook Trout	19,475	22,399	17,500	12,656
Brown Trout	1,700	1,620	0	0
Totals	58,425	54,878	79,300	73,997
Sunderland				
Rainbow Trout	62,021	69,317	65,850	48,333
Brook Trout	69,900	30,881	55,050	26,144
Brown Trout	96,850	31,515	83,350	25,965
Kokanee Salmon	0	0	29,000	211
Totals	228,771	131,713	233,250	100,653
Palmer				
Rainbow Trout	81,565	15,307	0	0
Brook Trout	20,300	5,228	140,548	8,327
Brown Trout	297	700	13,946	7,436
Landlocked Salmon	17,920	1,280	0	0
Atlantic Salmon	0	0	7,200	1,200
Kokanee Salmon	0	0	15,000	25
Totals	120,082	22,515	176,694	16,988
Sandwich				
Rainbow Trout	122,000	55,310	106,230	39,121
Brook Trout	38,150	13,828	47,040	18,703
Brown Trout	18,178	5,884	37,520	16,303
Coho Salmon	11,000	500	67,000	3,570
Totals	189,328	75,522	257,790	77,697
Grand Total	1,090,171	544,299	1,290,775	475,849

WILDLIFE

Chet M. McCord
Chief of Wildlife Research

The Wildlife research section has the responsibility to provide the Division with the data necessary to make the many management decisions facing a natural resource agency today. Many of the monitoring tasks involved in keeping tabs on wildlife populations remain unchanged, but the field of wildlife research is becoming more and more complex with the advent of law suits aimed at challenging many of the tenets of natural resource philosophy. While the job of monitoring wildlife populations and other social and environmental factors continues along with adjusting management regulations as needed, the added responsibilities of defending natural resource management in the courts has been an unwelcome addition.

This was illustrated during FY1980 with the circumstances relating to bobcat management. During the mid-1970s, several antihunting groups took up the bobcat as their banner species. Although the cat was abundant nationally, these groups were able to convince people that the cat was in danger of extinction due to overtrapping. Their cause was enhanced by the listing of all felids on Appendix II of the Treaty on International Trade in Endangered Species. Such listing was without biological justification but the antihunting groups took advantage of the situation in this state by introducing bills in the state legislature to ban the taking of bobcats, and by challenging export of bobcat pelts in Federal court. All these activities required extensive counter efforts which cut into the basic priorities of the section.

During FY1981, a similar problem arose with management of coyotes. The coyote came into this state 25 to 30 years ago, and has since expanded its range statewide. It is hunted and trapped, frequently without limit, in all adjoining states except Rhode Island; yet, coyote numbers continue to increase showing, as in the West, that the animal is able to flourish despite traditional hunting and trapping seasons. During FY1981, the Fisheries and Wildlife Board voted to open a limited hunting season with a mandatory carcass turn-in and a pelt-tagging requirement. This season, which would provide much needed population data, was vigorously opposed by antihunting and humane groups whose arguments were almost exclusively philosophical.

A minimum of controversy marked the Division's successful reestablishment of a wild turkey population--the culmination of a project which had started in 1972--and the initiation, in FY 1980, of the first turkey hunting season in more than 100 years. This was a limited season with hunting by permit only during the first two weeks of May, a period when hens would be nesting and thus secluded, while gobblers would respond readily to calls. To protect nesting hens which forage during the afternoons, the season was set to run from one-half hour before sunrise to 11:00 A.M. (See Footnote 1, page 21.)

Another major change during FY1980 restricted weapons which could be used during the primitive firearms season. (See Footnote 2, page 21.)

Also in the bobcat season, there had been voluntary carcass collections for two years which provided about 60 percent of bobcat carcasses for analysis. This was not an adequate sample in view of the small number of bobcats being taken; therefore, the Board made the carcass turn-in mandatory.

The basic premise of pelt tagging is to permit an accurate and controlled enumeration of the fur harvest. Nontransferability of tags was an essential, but hitherto unstated, component of this monitory system. Since there was at least one instance where an individual attempted to transfer tags from pelt to pelt, it was important to clearly state the prohibition against this activity and to define the duration the tag must remain on the pelt. So the Board stated that the tags were nontransferable and had to remain on the pelt until the pelt was dressed.

To prevent any conflicts with the opening of the archery season, the paraplegic season was changed from opening the first Monday in November to the last Monday in October.

During FY1981, responding to indications that the beaver population was depressed in the western part of the state, the Board voted a zoned season for trapping beaver with later opening dates for the western zone.

The otter season was also moved back to slightly reduce that harvest to bring it in line with Division objectives, and the season was opened at the same time as beaver since trapping methods were similar for both. The western zone was opened 15 December and the zone east of the Connecticut River was opened 23 November. All closed on the last day of February.

The fisher season was cut from 61 to 30 days due to an exceptional rise in harvest from 48 to 169. The biological data derived from the harvest continues, however, to show the population in good health and in no danger presently. Additionally, it was proposed that the 220 Conibear trap be made legal on land when set in a tree six feet above the ground. This proposal was not approved.

Research activities during the reporting period were as follows:

Waterfowl

Preseason Banding

Seven hundred ninety-nine (799) birds were banded during the 1979 preseason banding: 270 wood ducks, 324 mallards, 109 black ducks, 16 mallard x black hybrids, 38 green-winged teal, 29 blue-winged teal, 1 pintail, 1 American wigeon and 1 hooded merganser. Also banded were 2 coot and 2 soras. A cooperator banded an additional 5 least sandpipers and 1 killdeer.

Five hundred thirty-four (534) ducks were banded during the 1980 preseason banding: 274 wood ducks, 167 mallards, 63 black ducks, 7 mallard x black hybrids, 12 green-winged teal, and 11 blue-winged teal. Also banded was 1 sora. A cooperator banded an additional 150 least sandpipers, 27 killdeer, 17 solitary sandpipers, 17 spotted, 11 semipalmated, 2 pectoral and 1 western sandpiper, 1 semipalmated plover and a lesser yellow legs.

Winter Inventory Flights

A total of 183,688 waterfowl ere counted during the January 1980 winter inventory, up 9 percent over 1979 and 56 percent over the ten-year average. Black ducks, 20,417, were up 47 percent over 1979, 7 percent above the ten-year average. Mallards, canvasbacks and sea duck numbers were up from last year, while mergansers, scaup, goldeneyes and Canada geese were down. Buffleheads were unchanged.

During the January 1981 winter inventory, 136,353 waterfowl were counted, down 26 percent from 1980 but 8 percent over the ten-year average. Black ducks (24,736) were up 21 percent over 1980, 28 percent above the ten-year average. Only scaup numbers were significantly higher than in 1980. Extensive ice conditions and severe weather resulted in low counts for most other waterfowl.

Winter Banding Program

The winter of 1979-1980 was an exceptionally mild one with brief cold spells in February that froze over mussel flats in many bays and harbors. A total of 668 black ducks were banded by the Division. Parker River National Wildlife Refuge personnel banded an additional 535 black ducks under their permit, thus exceeding the state's quota of 1,000 black ducks required by the United States Fish and Wildlife Service.

The Division participated in the third year of a black duck reward band study. A total of 120 reward bands were placed on wintering black ducks by Division and Refuge personnel.

The winter of 1980-1981 began with an extremely cold period shortly before Christmas that lasted through the third week of January. This resulted in extensive icing along coastal areas and deprived black ducks of food sources. Ducks came readily to bait sites allowing banders to achieve their quotas by the end of January.

The Division cooperated with the Massachusetts Audubon Society in an emergency feeding program. Fortunately, conditions moderated in early February and losses to starvation were minimal.

A total of 954 male and 592 female black ducks were banded. These, along with 180 males and 63 females banded by the personnel of the Parker River National Wildlife Refuge, exceeded the state's quota of 400 males and 600 females. The high ratio of males to females (1.7:1) means we must band nearly 1,600 black ducks to get the 600 required females. Furthermore, since hybrids make up about 18 percent of the birds banded and mallards and other species another 4 percent, we must band 2,000 birds or so to insure banding 600 female black ducks. Finally, because of the prevalence of previously-banded birds in our flocks, it is necessary to actually capture 2,400 birds to achieve the 600 new female black ducks required, about a quarter of the total birds handled.

Park Waterfowl Investigations

Data from park mallard landings were run through several computer models to determine survival rates. The resultant data show that park waterfowl can be divided into three categories: park residents, local residents, and wild migrants. While most birds remain within 50 km of a park, more than a quarter of the birds move over 100 km to nest. Mallards banded during the winter months tend to winter in the same area during succeeding years. The survival rate of wintering park mallards was 61 percent for males and 48 percent for females. Parks are important to the ecology of the mallard in Massachusetts and virtually all wintering by mallards in the state occurs in parks. In this manner, the parks are important to both year-round residents and wild-nesting birds. Any management plans for the mallard in the Northeast must consider the role of parks in the ecology of the mallard.

Wood Duck Population Study

A final version of a bulletin summarizing wood duck research in Massachusetts from 1970 to 1980 was completed and sent to the Assabet Valley Regional Vocational Technical High School for printing. It is expected to be available in 1982.

Relationship of Canada Geese to Commercial Shellfisheries

Field observations and examination of goose gizzards did not verify claims that Canada geese ingested shellfish. The feeding activities of geese over shellfish beds did disrupt and expose clams to the elements and to possible ingestion by other predators including black ducks and mallards.

Waterfowl Gizzard Shot Survey

By the end of FY1980, a total of 2,342 waterfowl gizzards had been checked manually for ingested shot. In April 1980, a sample of gizzards was also fluoroscoped to develop a correction factor for shot missed by manual examination. This was determined to be 35 percent. Because ingestion rates were below 2 percent in Barnstable and Bristol Counties. the three steel shot zones in them were eliminated.

During the 1980-1981 season, we solicited gizzards only from black ducks and mallards taken in our remaining steel shot zones in Essex and Plymouth Counties. The samples were sent to the Northeastern Diseases Research Center, Storrs, Connecticut where they were X-rayed. These results were combined with findings from previous years. The total ingestion rates to date indicate a 12.3 percent rate for the Wareham-Weweantic River area and hence a need for continued steel shot zoning. The rate for the Plymouth Bay area was 4.3 percent, below the 5 percent guidelines set by the United States Fish and Wildlife Service. This area was removed from steel shot regulations. The total ingestion rate for the Essex County steel shot zone is 5.6 percent but the highest levels are on the Parker River National Wildlife Refuge. The rate for the marshes south of the Parker River is only 3.6 percent.

Based on these findings, observations of wintering populations and analysis of banding and distribution data, we recommend that the steel shot requirement be restricted to the Parker River National Wildlife Refuge and Plum Island and the marshes 150 yards south of the Parker River northwards to the New Hampshire line.

Experimental Waterfowl Seasons Appraisal

Responses from 422 Massachusetts waterfowlers indicate a preference for a three-segment season with hunting during 10-20 October, 11-29 November and 20 Decmeber-10 January. The Thanksgiving weekend appears to be the single most popular hunting period. Fifty-three percent of the waterfowlers hunt geese, 21 percent hunt specially for sea ducks and 13 percent for scaup. Forty-eight percent of waterfowlers hunt in steel shot zones. Comments by hunters indicate a desire for Sunday hunting in Massachusetts and the belief that we do not need steel shot zones.

The 1979-1980 waterfowl season harvest was below that for 1978-1979, despite the three-way split option. Unusually mild temperatures throughout the season delayed migration resulting in very low harvest during November and the middle segment, normally a period of peak migration. During 1980-1981, there was no experimental season.

Wetlands Assessment Study

Wetland maps, previously developed based on 1971-1972 mapping data, were used to initiate a card file on wetlands of potentially moderate to high waterfowl value. To date, 71 areas in northern Worcester County have been identified. Each area was given a ten-digit code number. The first three digits identified topographic map, the next three town, and the final four digits the wetlands complex. The wetlands acreage was determined for each wetland type and the total size of the wetland indicated on the card as well as the type breakdown.

Wood Duck Nest Box Study

Both summer and winter box checks showed 188 nest attempts in 1979, but 17 nests were missed during winter checks while 16 boxes reported to have nests during the winter checks were, in fact, unused during the summer of 1979. The nests thus reported were left over from earlier years. Boxes that had unreported nests were missed because (1) boxes were used twice in one season, (2) boxes had fallen down by the time of the winter check, and (3) nesting sign had disappeared.

In 1980, summer checks indicated 176 nest starts, a usage rate of 34 percent. Winter checks by district personnel indicated 178 nests for a 35 percent usage rate.

Deer

The 1979 statewide deer harvest for all seasons was 3,002 deer, one below the 1978 harvest of 3,003. This breaks down as follows:

During the 18-day archery season, mainland archers reported harvesting 186 deer (139 males, 47 females). The Nantucket archers reported 11 deer (6 males and 5 females). One male and no females were reported by Martha's Vineyard bowmen. The statewide archery harvest was 198 deer (146 males and 52 females).

Paraplegic deer hunters harvested 2 deer (2 males) during the special two-day season.

During the special three-day primitive firearms season, 98 deer were reported statewide (48 males and 50 females). Ninety-four deer were taken on the mainland and 4 on Nantucket Island.

During the six-day shotgun season, hunters harvested 2,706 deer. Of these, 1,957 were males (177 male fawns) and 749 were females. A total of 2,580 deer were harvested on the mainland. Hunters reported 168 deer on Nantucket Island, and 98 deer on Martha's Vineyard. The top four deer-producing counties were Berkshire, Franklin, Hampden and Hampshire, in that order.

The 1980 season brought the largest harvest since the antlerless deer permit system was instituted in 1968. The statewide total was 3,494 deer with 74 percent of the harvest reported once again from Berkshire, Franklin, Hampden and Hampshire Counties. During this season, more antlered males were taken than in the year of Highest Harvest (1958) when deer of any sex could be taken without permits.

Archery continues to increase in popularity. The three-week season had more participants and a higher harvest than ever before. The 1980 archery harvest was 239 (181 males; 52 females).

Paraplegic hunters took 3 deer, 5 from Berkshire County and 3 from Nantucket.

During the primitive firearms season, hunters reported 211 deer (83 males and 123 females).

Deer (Continued)

As always, the bulk of the harvest came during the week-long shotgun season during which, in 1980, hunters reported harvesting 3,035 deer. Of these, 2,205 were males (232 male fawns) and 830 were females. A total of 2,743 deer were taken on the mainland, 162 from Nantucket, 76 from Martha's Vineyard, and 55 from the Gosnold Islands.

Beaver

A record harvest of 2,121 beaver was taken by 189 trappers (also a record) in 114 towns during the 1979-1980 season. This take was 1,105 more than in 1978-1979 and 861 more than a ten-year (1970-1979) average. Extremely mild and unusual weather conditions in December 1979-January 1980 permitted an extended period of ice-free trapping, resulting in the season's high take.

The revised 1980-1981 beaver season permitted trapping west of the Connecticut River from 15 December to 28 February and east of the river from 23 November to 28 February. During these periods, a total of 906 beaver were taken by 135 trappers in 97 towns. This take represented a decrease of 1,215 from 1979-1980. The decreased take was reflected in all counties; however, the percentage from each county remained relatively constant from 1979-1980 to 1980-1981. The take west of the Connecticut River and the November take reflected the restrictions imposed by the revised season, with 434 beaver (47.9%) taken in the western zone and 225 (24.8%) taken in November in 1980-1981 as compared to 1,232 (58.1%) and 804 (37.9%) in 1979-1980.

Otter and Fisher

During 1979-1980, a total of 157 otters were taken by 95 trappers in 76 towns for a mean of 1.6 otters per successful trapper. This compares with a take of 121 and a mean of 1.9 for 64 trappers in 1978-1979. A record harvest of 169 fisher was taken in 1979, with 54 trappers in 43 towns averaging 3.1 fisher per successful trapper. Otter were taken primarily in Worcester (47), Berkshire (32) and Franklin (23) Counties; fisher were harvested principally in Worcester (82), Franklin (38) and Middlesex (34) Counties. The mean age of otter taken in 1979-1980 was 2.46 years and fisher 2.30 years. This compares with 1977-1978 mean ages of 2.54 for otter and 1.68 for fisher.

In 1980, the otter season was shortened to coincide with the beaver season. The fisher season was also shortened from 61 to 30 days. During the revised season, 85 trappers took a total of 143 otters in 78 towns for a mean take of 1.7 otter per successful trapper. This compares with a take of 157 and a mean of 1.6 in 1979-1980. The fisher take decreased from 169 in 1979 to 115 in 1980, with 48 trappers taking fisher in 43 towns for a mean catch of 2.4 fisher per successful trapper. Worcester (49), Berkshire (23), and Essex (21) Counties yielded the most otter; Worcester (67) and Franklin (31) Counties produced the most fisher. The mean age of otter taken in 1980-1981 was 3.06 years, as compared to a mean age of 2.38 in 1979-1980.

Coyote

The Fisheries and Wildlife Board approved a coyote hunting season, with mandatory pelt checking, to commence in the fall of 1981.

Mourning Dove

The total number of calling doves on three long-term standardized routes in 1980 increased 32 percent from 31 to 41 doves. Counts on all 17 routes conducted increased 38 percent from 134 to 185 doves heard.

The total number of calling doves on those three standardized routes decreased five percent from 41 to 39 doves during 1980-1981. Counts conducted on all 17 routes decreased only one percent (185 to 183) from 1980 to 1981.

Turkey

Massachusetts' first turkey hunting season since 1851 was held in May 1980 in Berkshire and Franklin Counties. A total of 1,250 permits were allotted with a total of 72 turkeys taken in 22 towns during the two-week season. Berkshire County yielded 66 turkeys and Franklin County 6. The greatest harvest was on opening day (21), with 3 to 9 turkeys taken each day thereafter (except 13 May, with none). The average hunter used a box call and a 12-gauge shotgun with No. 4 shot. Adult turkeys weighed from 13.3 to 21.3 pounds,gutted; immatures from 12.5 to 14.4 pounds, gutted. Fifty-three or 74 percent of the turkeys taken were adults.

No turkeys were captured during late-winter trapping efforts. These negative results were attributed to mild weather which permitted more free movements and easier feeding by the turkeys.

The second spring gobbler season was held during a two-week period in May 1981. A total of 2,500 permits were allotted, with 136 birds taken in 26 towns. Berkshire County yielded 131 birds and Franklin County 5. Three-quarters of the take was during the first week. Adult turkeys weighed 14.1 to 21.0 pounds, gutted; immatures 11.5 to 15.2 pounds, gutted. Adults comprised 62 (46%) of the total taken. Two eight-year-old banded birds were shot, including one from the 1973 Beartown release.

Sixteen turkeys (10 hens, 6 toms) were captured during winter trapping efforts. Thirteen birds (9 hens, 4 toms) were released in Hubbardston State Forest, Worcester County. The 3 remaining birds were released on the DAR State Forest, Goshen, Hampshire County.

Black Bear

A record number of 880 bear permit applications was received during 1979, surpassing the previous record of 574 in 1978. Three bears were taken by legal hunting, including one each in Berkshire, Franklin and Hampshire Counties. One depredation kill was recorded and one bear was found dead of unknown causes. New reports of 35 observations involving 46 bears were received from 26 towns. Twelve nuisance complaints were received, including beehive, corn, and blueberry depredations and residential and trash problems. Arrangements were initiated with the Massachusetts Cooperative Wildlife Research Unit (CWRU) regarding an expanded bear study.

During 1979-1980, a record number of bear permit applications (1,103) was received, producing a record kill of 10 bears since mandatory checking was established, and a record bear (467 pounds dressed) for Massachusetts. Five bears were killed by hunters in Berkshire County and 5 in Franklin County. Two road kills and one nuisance kill were also reported. New reports of 68 observations totaling 85 bear were received from 38 towns. Nine nuisance complaints were received, including beehive and corn depredations.

Wildlife Species Files

A wildlife species filing system was begun in 1979 to maintain data on distribution, harvest, seasons and management of wildlife species in the Commonwealth. At the present time, files for 137 species, not including waterfowl, have been initiated and a computer program on wildlife distribution is in preparation.

Footnote 1

The first turkey season in the state's history took place during the first two weeks of May. This period was selected as the time when most hens are nesting and, therefore, unavailable, but gobbling is still high and toms can be called readily. The gobbling is most intense during the early morning and drops off during the afternoon. For this reason, and as a protection for hens which leave their nests to feed during the afternoon, hunting was limited to the period from one-half before sunrise to 11 o'clock in the morning.

It was further limited to Berkshire and Franklin Counties and was by permit only. A total of 1,250 permits were issued by a random drawing process. These permits had to be carried in the field and included a tag which had to be attached to the turkey at the time of kill.

Weapons were restricted to shotguns no larger than 10 gauge using shot sizes from No. 2 to No. 6 or bows and arrows of at least forty-pound pull at 28-inch draw with arrows that had well-sharpened steel broadhead blades not less than seven-eighths of an inch in width nor greater than one and one-half inch. Baits, traps, dogs, live or artificial decoys and electronic callers were prohibited.

Hunters were limited to one bearded turkey which was to be presented whole (although entrails may be removed) at an official checking station for tagging within 24 hours of the taking.

Footnote 2

Beginning in 1980, original or replica flintlocks and caplocks of the type used before 1865 are the only weapons permitted during the Massachusetts special three-day "primitive firearms" deer season. The decision, rendered by the Fisheries and Wildlife Board at their June 1979 meeting, came after a year of study during which the Board reviewed the original intent of the season and the methods of hunting presently in use. Over a period of six years, technological innovations had so stretched the wording of the regulations that the weapons being used were almost as good as a modern shotgun. For example, a pre-1865 caplock or flintlock had no break-open breech and all firing mechanisms were exposed. When the humidity was high, the weapon was unlikely to fire. Innovations like the H & R Huntsman changed that. The Huntsman has a break-open breech and has all firing mechanisms enclosed so they are protected from the elements. Old style percussion caps were replaced by a modern shotgun primer which made the weapon fire as dependably as a modern shotgun.

Innovations continued with adapter or converter plugs which would fit into any shotgun instantaneously, making it into a "primitive firearm." Projectiles went from the old round balls, fine for 50 yards or so, to ballistically more desirable rifled slugs. Smokeless powder was used in place of black powder. It became apparent that regular shotgun shells could be cut in half with the brass and placed in the breech as a "converter plug" and the slug loaded from the muzzle to meet the definition of a muzzle-loaded or primitive weapon.

Footnote 2 (Continued)

All of these improvements were producing an increase in the harvest. In particular, the harvest of does had doubled each year for several years and at that rate, the kill would have an impact on the Division's deer management program in two to three years.

With this in mind, the Board evaluated a number of regulations designed to restore the original intent of the season. In rendering the decision, the Board precluded the use of the H & R Huntsman, converter plugs and scopes. Permissible powder was limited to black powder, Pyrodex, or other synthetic substitutes as approved by the National Muzzle Loading Rifle Association, and projectiles were limited to a single, round, lead ball. In addition to firming up regulations on allowable weapons and accessories, the Board adopted new wording to clarify definitions of a muzzle-loading weapon and an unloaded weapon.

GAME FARMS

E. Michael Pollack
Chief Game Biologist

During FY1980, major pen construction was continued at all game farms, a project in which CETA and YACC crews were most helpful in supplying labor. Pens needing maintenance were repaired or replaced with new pens. Repairs on brooder house roofs, water lines and electrical systems were conducted at all game farms. Production during this period was normal despite the recurrence of vandalism. Feed costs continued to climb although not as sharply as in previous years. Control of disease and cannibalism resulted in production of high quality birds, and research into the use of automatic feeding and watering devices which may reduce labor costs was continued at all game farms.

FY1981 was a "banner year" for all three farms. The quality of the birds released was superb! They were fat birds, excellent flyers with long tails which stand as a tribute to the hard work of game farm personnel. Game farm staffs also continued to explore ways to reduce rearing costs, losses due to disease, etc. as rising costs of feed and utilities continued to plague the program.

During both 1980 and 1981, the Sportsmen's Club Pheasant Rearing Program was active in raising and releasing several thousand birds.

Game Farm Production

1979-1980

Pheaant

Game Farm	SR	A	B	C	PG	Misc.*	Totals
Sandwich	250	-	1,744	4,906	6,052	425	13,377
Wilbraham	1,960	0	3,572	8,888	7,108	550	22,078
Ayer	2,590	64	2,592	4,784	13,676	770	24,476
Totals	4,800	64	7,908	18,578	26,836	1,745	59,931

Quail

A total of approximately 3,000 quail, produced at the Sandwich State Game Farm, were released on the wildlife management areas in the Southeast Wildlife District. In addition, approximately 500 quail were distributed for field trial purposes.

White Hare

A total of 594 white hare were purchased from a source in New Brunswick, Canada. Releases were made in all five districts.

1980-1981

Pheasant

Game Farm	SR	A	B	C	PG	Misc.*	Totals
Sandwich	220	-	1,712	3,052	4,780	790	10,554
Wilbraham	1,425	-	3,540	8,880	6,728	124	20,697
Ayer	2,335	60	2,960	4,999	12,564	526	23,444
Totals	3,980	60	8,212	16,931	24,072	1,440	54,695

Quail

A total of approximately 4,200 quail, produced at the Sandwich State Game Farm, were released on the wildlife management areas in the Southeast Wildlife District. In addition, approximately 600 quail were distributed for field trial purposes.

White Hare

A total of 572 white hare were purchased from a dealer in New Brunswich, Canada.

* Miscellaneous - Approximate numbers of birds for field trials, displays, youth hunts, etc.

NON-GAME AND ENDANGERED SPECIES

Bradford G. Blodget
Assistant Director
Nongame and Endangered Species

In November 1979, I was appointed to this new post within the Division, bearing chief responsibility for the management and conservation of nongame and endangered species. Because of the often superficial distinction between game and nongame species, coordination with game biologists has been and remains close to assure an integrated approach to wildlife management in the Commonwealth. The program, still in its infancy, has been inhibited by a lack of funds expressly set aside for a nongame program. Since January 1980, however, there has been a staff member--James Morash, State Ornithologist--whose responsibilities will include maintenance of nongame records as well as state ornithological information.

Morash, however, left his position as State Ornithologist in February 1981 and, as of 30 June 1981, the post remains unfilled owing to continuing financial uncertainties of the agency as a whole. Without a source of nongame revenues of its own, the Nongame and Endangered Species Program continues to be dependent on the Inland Fish and Wildlife Fund. Cutbacks in that fund will likely be passed on, in part, to the Nongame and Endangered Species Program.

At the Federal level, impacts were felt as well, with austerity cuts in many programs including the elimination of grant-in-aid funding to the states for the continuation of the state/Federal endangered species cooperative program.

Despite abundant evidence of a gloomy, short-term outlook, the long-term forecast looks good. National public opinion polls have indicated clearly public interest in wildlife programs and in innovative revenue sources which can provide funds for exciting and progressive programs.

Statutory and Regulatory Matters

The following changes in laws, rules and regulations having a bearing on nongame and endangered species took effect in FY1980:

1. Sections 4 and 5, Chapter 131, Massachusetts General Laws, were, effective 5 October 1979, amended by Chapter 614 of the Acts of 1979, granting the Division of Fisheries and Wildlife clear

authority to investigate, manage and regulate reptiles and amphibians. Rules and regulations pertaining to the taking of reptiles and amphibians from the wild within the Commonwealth were published in the Massachusetts Register (Issue 206), dated 17 April 1980 and became effective upon publication. Found at 321 CMR part 3.05, these rules and regulations state, among other things, that no person shall disturb, harass or take by any means a Plymouth red-bellied turtle or any one of five species of endangered or threatened marine turtles. Twenty-five species may not be possessed except under special permit. No species may be taken for commercial sale unless under permit. The snapping turtle becomes the only reptile or amphibian that may still be taken at any time and with no limits. Bullfrogs may be taken only from 16 July to 30 September inclusive, with a possession limit of six.

2. Section 4, Chapter 131, Massachusetts General Laws was, effective 13 November 1979, amended by Section 1, Chapter 726 of the Acts of 1979, giving the Director explicit powers to investigate all non-game wildlife and wild plants and to promulgate rules and regulations establishing a list of species recognized by the Commonwealth to be endangered and threatened. Such rules and regulations, after a public hearing, were published in the Massachusetts Register (Issue 206) and became effective 17 April 1980. Found at 321 CMR part 8.01, these regulations define the terms "endangered" and "threatened" and adopt in total the United States List of Threatened and Endangered Wildlife and Wild Plants. In addition to species on the Federal list, the small whorled pogonia, as well as the Plymouth red-bellied turtle, which as of 17 April 1980 had still not been listed by the Fish and Wildlife Service, was listed as "endangered" on the state list. The turtle was listed as "endangered" by the Federal government effective 2 May 1980.

3. Effective 13 November 1979, Chapter 726 of the Acts of 1979 amended Section 26A of Chapter 131 by striking out the old statutory list of endangered species and substituting in place thereof provisions that no person may sell any species or part of said species that appears on the Commonwealth's list of endangered species without obtaining a permit from the Division under provisions of Section 23, Chapter 131.

4. Section 90 of Chapter 131, Massachusetts General Laws was, effective 13 November 1979 to provide penalties of up to $1,000 or imprisonment for up to a year or both for selling any endangered species or parts thereof in violation of the provisions of Section 26A.

5. The "Exemption List" (the list of animals, excluding domestic animals, which may be imported, maintained or possessed without a permit and which is found at 321 CMR part 9.01) was substantially revised and published in the Massachusetts Register (Issue 206), 17 April 1980, to become effective 16 July 1980.

In December 1979, responding to certain new responsibilities pertaining to wild plants stated in Section 1, Chapter 726 of the Acts of 1979, the Division investigated the possibility of requesting an amendment to our endangered species cooperative agreement to expand it to encompass wild plants. In an opinion from the office of the Attorney General of the Commonwealth dated 4 March 1980, it was indicated that a jurisdictional conflict relative to wild plants appears to exist between the Division of Fisheries and Wildlife and the Department of Environmental Management. This matter remains under study and no further action is anticipated at this time.

No changes in laws, rules or regulations having a bearing on nongame or endangered species took effect in FY 1981 except that, "Chinchilla derived from captive stock" was added to the "Exemption List" found at 321 CMR 9.01(7)(b)(12). These mammals may not be imported, maintained or possessed without permits.

Nongame Legislation

The Division adopted a dramatically new position on nongame legislation in FY 1980. After seven years of struggle, it was recognized that further expenditure of time and energies was no longer justifiable. It had become apparent that entrenched philosophical positions would forever doom nongame bills. More significantly, a thorough review of Massachusetts statutes revealed that the Division already had a clear mandate to operate a nongame program. Attention was, therefore, focused on ways to obtain funding for the nongame program. To this end, the Division supported S-1142, a bill that, if passed, would have established an income tax check-off scheme for nongame funds. It was, however, not passed into law and so, early in FY 1981 another bill was filed to establish the income tax check-off. This system, originated in 1978 in Colorado, has proved so successful that by June 1981, fourteen states had a nongame check-off system.

This legislation is of critical importance since it would provide a source of "up front" money which is essential for participation in Federal grant-in-aid programs. To date, the Division has been limited in the extent to which it can participate in such programs for nongame because of the lack of a suitable source of nongame "up front" funds.

At the Federal level, the Fish and Wildlife Conservation Act of 1980, often referred to as the Forsythe-Chafee Act, was signed into law. Its primary purpose is to provide financial and technical assistance to the states for the development, revision and implementation of conservation plans and programs for wildlife, and particularly emphasizes planning for nongame, fish and wildlife conservation and management. Although Congress authorized up to $5,000,000 for each of the fiscal years 1982 to 1985, the Administration's proposed FY 1982 budget does not include funding for implementation of this act.

Policy Relative to Possession of Wild Animals as Pets and the Maintenance of Private Menageries

A major decision was made in June 1980 to become effective 1 July 1980, to discontinue the practice of issuing permits for the possession of wild animals (non-exempt) for the purpose of pets or private menageries. This decision also applies to skunks, including captively-propagated descented animals that had been commonly sold in pet stores. Animals held under permits prior to 16 July will be "grandfathered." Permits will continue to be issued in instances where the animals are desired for bona fide educational, scientific or occupational uses or for purposes of commercial propagation.

Cooperative Endangered Species Agreement

During FY 1980, a cooperative agreement for the management of endangered species was consummated between the U. S. Fish and Wildlife Service and the Division. Signed at the end of August 1979, the agreement means that the Division is eligible for two-thirds grant-in-aid monies for approved endangered species projects.

The agreement was renewed effective 1 October 1980 and again on 1 October 1981. Under the agreement, preparation of a Federal Aid application for an endangered species project was initiated and effective in October 1980. Agreement was reached for studies totalling $84,000 (of which the Federal share was $56,000).

Peregrine Falcon

Early in FY 1980, six peregrine falcons released at Mount Tom hacking site disappeared under mysterious circumstances. In conjunction with the Division of Law Enforcement, a news release was issued seeking information on these birds or any clues regarding the circumstances of their disappearance, without any results. As a result of this loss, hacking activities at Mount Tom were suspended indefinitely. Use of a site atop an office building in downtown Boston remains under consideration. In mid-April, the State Ornithologist field checked 14 former eyries in western Massachusetts for nesting activities, with negative results.

No peregrines were hacked in the Commonwealth during FY 1981. However, one wild nesting pair was confirmed on 8 June 1981 by Rene Bollengier, Jr., former leader of the Eastern Peregrine Recovery Team in Crowford Notch, New Hampshire. Two young were fledged. This was an event of great importance to ornithologists and it indicates that wild nesting peregrines may eventually recolonize Massachusetts.

Bald Eagles

On 11 January 1980, the Division coordinated a statewide midwinter bald eagle survey in conjunction with the National Wildlife Federation. A total of 25 bald eagles was recorded, with all birds within the Quabbin Reservation except for one at Wellfleet. This count, an increase from eight in January 1979, was the highest count in recent years and possibly reflected improved productivity and survival and the unusually ice-free Quabbin Reservoir.

On 9 January 1981, the Division coordinated the third statewide bald eagle midwinter survey. Fifteen eagles were estimated in the Quabbin Reservation, three along the Merrimack River, two in the Connecticut River Valley, and one at Martha's Vineyard. At the end of January, eagles along the lower Merrimack River increased to seven immatures, reminiscent of the numbers present there in the late 1940s when eagles regularly wintered there. Some of these birds were observed utilizing the Division's Carr Island and Ram Island Wildlife Sanctuaries downstream from the "chain bridge" in Salisbury.

Indiana Bat

In March 1980, biologists from the Division entered the Old Emery and Macia Mines in the Town of Chester to inspect bat hibernacular for the presence of Indiana bats reported there in 1938-1939. None were found but five individuals were found of the uncommon small-footed bat. In April 1981, the mines were resurveyed. Although no Indiana bats were found, 487 bats were recorded of which 214 were examined and identified. Those so examined were 140 Little brown bats, 54 Keen's bats, 19 Eastern pipistrelles and 1 small-footed bat.

Plymouth Red-Bellied Turtle

In May 1981, the Massachusetts State Ethics Commission cleared up possible conflict of interest in Dr. T. E. Graham's research on the Plymouth red-bellied turtle under contract with the Division while salaried at Worcester State College. Once the contract was signed, special tarred turtle traps, line nets and four fyke nets were purchased for continuing studies.

Significant progress was made in life history studies on this rare reptile. Special Petersen disc tags were applied to assist in identification of individual turtles and to advise finders not to molest the turtles and to assist the Division by promptly reporting sightings.

In June, using Pitocin^R, gravid females were induced to lay 29 eggs. These will be incubated and hatchlings will be overwintered and "head-started" the following season. Also, in FY 1981, expanded effort was made to examine predation levels and to identify specific nesting areas.

Tern Management

The Division's operation in this important area continues to be largely confined to advisory and coordination functions. The Division became involved in a new management dimension with the United States Fish and Wildlife Service in a major gull control effort aimed at reducing the gull population at Monomoy Island where the huge gull population combined with erosion of the north island at Monomoy Wilderness Area threatens the existing tern colony there. State Ornithologist Morash participated in a gull census 19-22 May which resulted in a final estimated total of 18,587 pairs of nesting herring and great black-backed gulls in an approximate ratio of 5:1. In the designated control area, 1,406 nests were treated 4-5 June with DRC 1339 and a known total of 2,131 dead gulls were retrieved through

12 June. The Division believes that an ongoing gull control program will eventually have a positive effect on the tern population and will continue to support gull control efforts, even encouraging its expansion.

To the disappointment of the Division, the Fish and Wildlife Service discontinued the gull control program at Monomoy and opted to control gulls by shooting and nest destruction only in the vicinity of the Monomoy ternery, authorizing the Massachusetts Audubon Society to experiment with gull harassment techniques at Muskeget Island. It is the Division's position that such strategies underestimate the magnitude of the gull problem and will not beneficially affect the tern population in the Commonwealth in the long run. Stop-gap gull control measures will more likely be overwhelmed by the reproductive potential of the gulls, resulting in the eventual loss of more habitat. The problem is so large that even severe gull control measures would probably not yield demonstrable results for three to four years.

For the second year in a row, tern inventory results for 1980 indicate gains of approximately 15 percent for both least and common terns, with compiled results of 2,040+ pairs of least terns and 7,299+ pairs of common terns, compared with 1979 totals of 1,734+ and 6,168+ pairs respectively. However, it appears that roseate terns slipped 8 percent from 2,023 pairs in 1979 to 1,868 pairs in 1980 and Arctic terns dropped some 13 percent from 45+ pairs to 39 pairs. Arctics at Monomoy fell from 18 pairs in 1979 to only 4 pairs there this year. This change was partially offset by increases at Nauset Beach and Plymouth Beach, which two locations harbored almost two-thirds of the Commonwealth's Arctic tern population.

During the prime census period of 1-20 June, least terns were known to be breeding at 40 stations compared to 38 in 1979. Commons were found at 23 (v. 21), roseates at 9 (v. 7) and Arctics at 7 (v. 8).

Ninety-six (96) percent of our roseate population appears to be spread between Bird Island (1,400 pairs) and Monomoy (400 pairs). About 83 percent of all common terns were concentrated at five sites which, in order of size were: Monomoy (3,400 pairs), Gray's Beach (760 pairs), New Island (740 pairs), Bird Island (600 pairs) and Plymouth Beach (550 pairs). Least tern colonies of over 100 pairs were recorded at Nauset Heights and Nauset Spit (both 180 pairs), Sarson's Inlet area at Martha's Vineyard (135 pairs), Chappaquidick Island (130 pairs), Duxbury Beach (120 pairs) and Nashawena Island (108 pairs).

The number of pairs of common terns, after rising slowly for the past two years, was lower in the 1981 breeding season (June), declining 23 percent from 1980 to 5,625 pairs. This was the lowest since 1978 when 4,119+ pairs were recorded. The decline is believed to be principally attributable to the breakup of the Monomoy colony, exascerbated by the virtual absence of vacant habitat elsewhere in the Commonwealth. The Monomoy colony sustained continual habitat loss due mainly to erosion of the great black-backed gull colony. Although probably not as severe a factor as the foregoing, observers questioned for the first time whether growth and expansion of the laughing gull population (embedded within the tern colony), which reached 1,000 pairs in 1981, might not actually be starting to emerge as a negative factor. In addition, great horned owl and black-crowned night heron predation became more severe in 1981, leading to repeated night desertions and the eventual relocation of most of the roseate terns.

The remaining species declined insignificantly. Least terns fell to 1,856+ pairs, down from 2,040+ pairs in 1980. Roseate terns were off about one percent from 1980 to 1,851 pairs. Arctic terns dropped for the third year in a row, reaching 31 pairs, the same as in 1977.

Great Blue Herons

For the second year, a statewide inventory of great blue heron rookeries was conducted in June 1980. Forty-eight (48) active platforms were located which produced an estimated combined total of 116+ young. The distribution was similar to that of 1979 with a total of seven rookeries--three in Worcester County and two each in Franklin and Berkshire Counties. The largest rookery was at Westboro, where up to 15 platforms were built or repaired and occupied in the Suasco impoundment. Three of these nests appeared to be "practice" nests built by pre-adult birds. The other 12 nests all produced young--three with two young, one with three, two with four, five with five and one with six. Elsewhere, single nests were confirmed at Hardwick and Petersham.

In June 1981, all known or reported great blue heron rookeries were field checked. Seven rookeries were found to be active--four in Worcester County, two in Berkshire County, and one in Franklin County. Active nests totaled 97 with production estimated at 276 young or about 2.8 young per nest. Rookery sizes ranged from 41 to 3 active nests.

The Division feels that these data are potentially very valuable as baseline information as any future disruptions in productivity might serve as an early warning sign of acid rain or other environmental contaminants.

Osprey

Total osprey pairs breeding in the Commonwealth increased to 34+ pairs. Active nests numbered 11 at Martha's Vineyard, 20 in the Westport River Basin, 2 on Naushon Island and 1 at Round Hill, Marion. In June, a field trip was made to inspect the Westport colony under the guidance of Gilbert and Josephine Fernandez, whose tireless efforts have helped the cause of the Westport colony. The Division is indebted to Augustus Ben-David, whose vigilance and professional management has resulted in a growing osprey population at the Vineyard.

During 1981, nongame personnel continued to work supportively with the Fernandezes in management of ospreys in the Westport area and with Gus Ben-David at Martha's Vineyard. Between these two major colonies, 77 young ospreys fledged in 1981. Maintenance of the Westport and Martha's Vineyard osprey colonies has been carried out by the Fernandezes and Gus Ben-David. Productivity has now improved to a point that additional nesting platforms must be provided to foster continued growth and recovery of the population in areas where the species formerly nested.

In accordance with this need, the nongame program planned and initiated a major osprey nesting platform installation program in 1981 in conjunction with the Commonwealth Electric Company which agreed to donate poles and installation equipment. It is expected that up to eight installations will be made in FY 1982.

Other

Lesser investigations were made in FY 1980 on the bog turtle and the red-spotted newt. No specimens of the former were found at possible stations in Berkshire County. The newt is one of several species currently in demand for use by schools. Two permits have been issued to allow commercial collection for this purpose. Such permits have been carefully designed. The permittee must report annually the number of specimens taken and precise collection sites. Such information will be essential for monitoring these populations and the permittees have been notified that failure to produce the required information may result in the termination of their permits.

Work on the breeding bird atlas project slowed due to a lack of funds. The staff at Massachusetts Audubon Society is continuing to compile and assess these valuable data for what is still hoped will be eventual publication.

DISTRICT REPORTS

Northeast District, Walter L. Hoyt, District Wildlife Manager
Southeast District, Louis Hambly, District Wildlife Manager
Central District, G. Christopher Thurlow, District Wildlife Manager
Connecticut Valley District, Herman Covey, District Wildlife Manager
Western District, Winston Saville, District Wildlife Manager

The five wildlife management districts serve as the Division's operational arms, implementing research and management programs, serving as liaison with sports/conservation groups, reaching out to the general public, and maintaining the Division's lands and installations. Personnel from all five districts stocked trout, pheasants and varying hare in the appropriate seasons and operated checking stations where hunters checked in deer and, where appropriate, turkeys, while trappers checked their pelts. District staff members took part in ongoing research projects including waterfowl inventory and banding along the coast and collection of waterfowl gizzards for biological assay from areas in the Northeast where shot ingestion was being studied. Woodcock and mourning dove census counts were made and field personnel assisted Westboro staff in a statewide survey of the mast crop. Field crews also assisted the wood duck research project by checking and maintaining nesting boxes and putting up new structures in new locations as needed. This participation ranged from checking a limited number of boxes in the Connecticut Valley District which does not have an abundance of wood ducks to maintenance of about 350 boxes in the Northeast District which does. At the same time, staff of the Southeast District built and erected bluebird boxes (24 in 1980, 24 in 1981) in an effort to provide nesting areas for Sialis.

Fisheries Section staffs were heavily involved in conducting surveys on selected ponds and streams to determine species composition of fish populations, growth rates and productivity of the waters. Periodic pH checks were carried out on trout ponds to assess the effects of acid precipitation. Specific fisheries projects found crews from the Central District moving smelt eggs from Lake Quinsigamond to Comet Pond, Hubbardston while crews from the Southeast salvaged smallmouth bass from closed waters and moved them to open waters in need of additional predators (1500 in 1980; 620 in 1981). The Southeast crews also assisted biologist John Lindenberg in research on the use by fish of artificial reefs made from discarded tires.

A most innovative fisheries project was initiated by the Fisheries staff of the Northeast District in conjunction with staff from the Southeast District in 1980. Approximately 2,500,000 eyed walleye eggs were obtained from the State of New York Department of Fisheries and Wildlife. These eggs were reared at the Attleboro Fish Hatchery and 15,000 three to five-inch walleyes were released into Assawompsett Pond, Lakeville. During 1981, an additional 15,000 fingerlings, raised from the eggs obtained in 1980, were released into Assawompsett Pond and an additional 100,000 fry were stocked into adjoining Long Pond.

Because of heavy commitments of manpower in other areas, the bass-rearing facility at Harold Parker State Forest was not in operation during either 1980 or 1981.

Personnel from the Connecticut Valley District assisted Division biologists working at the Holyoke fishlift facility and, during 1981, built two holding tanks for Atlantic salmon. The District's game manager assisted the Division's bear project by building a live trap for bear during 180. Personnel from the Western District participated in the wild turkey program by assisting in winter trapping and transfer of birds from the Western District to areas designated by Project Leader James Cardoza.

District Managers represented the Division at sportsmen's clubs and at County League meetings. Theystudied and commented on environmental assessments and environmental impact reviews; they cooperated with local conservation commissions and worked closely with local watershed associations. They and other members of the District staffs provided technical assistance to individuals and groups requesting such aid. As one aspect of such aid, District staff responded to complaints regarding damage caused by beaver activity. The bulk of these complaints came from the Northeast (25 in 1980; 15 in 1981) and the Western District (54 man days in 1980; 75 man days in 1981). In addition to dealing with beaver problems, staff members provided guidance to citizens requesting assistance with other forms of wildlife.

Representatives of the districts visited all license sales installations to provide licenses, stamps, regulations, and so forth and to gather outdated material. They also maintained supplies of necessary forms at Freshwater Sportfishing award outlets.

In many cases, District Managers and members of their staffs addressed civic and school groups, sportsmen's clubs and scout groups in an effort to acquaint them with the needs of wildlife and the operations of the Division. District Managers in the Northeast and Connecticut Valley took part in radio programs designed to spread the information still further.

Another aspect of reaching the public came through District participation in shows and fairs. District staff assisted the Westborough Information and Education Section in building, setting up, and staffing exhibits for the Eastern States Exposition, the Boston Sportsmen's Show, and the Eastern Fishing Exposition in Boxborough. In addition, Districts participated in local events related to Hunting and Fishing Day and a variety of sportsmen's and agricultural fairs.

The Northeast District fisheries manager took a leading role in assisting with the Division's Urban Angler program which began and flourished during FY 1980 and 1981. Supporting this program of outreach to first-time anglers in urban settings, the District fisheries manager constructed display materials and participated in 25 clinics (12 in 1980; 13 in 1981).

A large part of the responsibility of each District is the care and maintenance of all Division properties within its jurisdiction. Meeting this mandate, District crews performed routine maintenance on buildings, fences, roads and trails. Gates were erected as needed, signs were posted along boundaries and in special use areas. Roads and parking lots were plowed. Trees were marked for timber cuts. Fields and open areas were limed, fertilized, seeded or planted to shrub as needed while wooded areas were thinned or cleared where required. Although most areas are used without special preparation, certain properties were specially set up for group camping, field trials and even military exercises (Southeast). Staff of the Northeast District prepared and operated controlled hunts on the Delaney and Martin Burns Wildlife Management Areas during 1980 and 1981, while staff from the Connecticut Valley District did the same on the Ludlow Wildlife Management Area. Crews from the Southeast District became involved in extensive brushcutting (161 acres in 1980) and building demolition on the Crane Wildlife Management Area (three buildings in 1980; 26 buildings in 1981).

During 1980 and 1981, fiscal reductions at the Federal level cut into YACC and CETA programs. These programs had, in the past, provided crews of trainees which had been based at District headquarters and which had allowed youngsters to learn techniques of construction and land management while assisting regular Division crews in maintenance and management operations. By June 1980, the YACC crew at Newbury was phased out and by the end of Fiscal 1981, all crews were gone. This is a great loss of fine, enthusiastic assistance, especially in the Northeast District where crews conducted a forest inventory and drew up a forest management plan for the Nissitissit River Wildlife Management Area, and in the Connecticut Valley District where crews had cut woodland border, operated a sign shop, contributed to general maintenance and completed construction of a field trial building.

STOCKING

Pheasant (including birds taken to sportsmen's clubs for rearing and eventual release in open covers)

	1980	1981
Northeast District	6,566	6,890
Southeast District	12,727	13,032
Central District	15,000	15,000
Connecticut Valley District	16,556	16,837
Western District	5,921	6,113
Quail		
Northeast District	-	400
Southeast District	4,200	3,550
Varying Hare		
Northeast District	118	113
Southeast District	120	181
Central District	118	120
Connecticut Valley District	164	120
Western District	113	60
Trout		
Northeast District	214,000	240,000
Southeast District	141,000	170,000
Central District	188,000	91,050
Connecticut Valley District	144,408	197,615
Western District	208,926	207,328
Salmon		
Western District	16,941	30,000* 326**

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*Kokanee Salmon
**Atlantic Salmon

INFORMATION & EDUCATION

Ellie Horwitz
Chief
Information and Education

During Fiscal 1980 and 1981, the Information and Education Section continued to address its mandate to inform sportsmen and other interested members of the general public about wildlife-related matters by any means available. One aspect of this involves direct response to direct mail or telephone inquiries. This is, perhaps, the most time-consuming part of the information program as many queries require specific, personal replies. Others can be answered by sending an appropriate publication, and still others can be forestalled by making fish and wildlife information generally available. To this end, the Section issued 15 press packages comprising 115 news items in 1980 and 14 packages containing 122 items in 1981. In addition, some news items were disseminated as "Tips to Outdoor Writers." In general, emphasis was placed on regulations, regulatory changes, and areas of exciting progress such as the first turkey hunting season held in Massachusetts in more than 100 years.

To further advise the public about wildlife issues and progress in wildlife management, a series of four taped radio announcements was produced in FY1980 and FY1981. The tapes were sent to major radio stations throughout the Commonwealth while press materials were sent to newspapers, radio and television stations, sportsmen's clubs, and a variety of other organizations which have expressed an interest in wildlife affairs. Although the radio list has held steady at about 25 stations, the press and clubs list has grown year by year, becoming increasingly unwieldy. Rising postal costs have made general mailings prohibitive. As a result, the Section undertook a radical pruning of the release distribution list. Renewal forms were sent to all release recipients and all nonrespondents were deleted. By the end of June 1981, the mailing list had been reduced to 450.

The press release program came under scrutiny as the Chief analyzed clipping returns, identified more and less successful items, and mapped locations of press release use. A report on press use of releases for 1970 to 1980 was prepared and submitted to the Director. This report highlighted the facts that interest in wildlife issues, if anything, has increased. Coverage is more uniform, month by month, than it was ten years ago and is higher in the heavily populated eastern areas than had been supposed. The press coverage accorded to the restoration of wild turkeys was singled out for special attention. Clippings were separated for use in a volume which documented the intense public interest in the return of this impressive bird.

To further keep the public informed, the Section updated, published and distributed the Division's annual publications including: Abstracts of Fish and Wildlife Regulations, Abstracts of Migratory Bird Hunting Regulations, Abstracts of the Fox-Bartley firearms law and of the Commonwealth's dog-restraining order. In addition, the Section provided up-to-date tables of hunting hours, lists of ponds and streams slated for spring and fall trout stocking, best ponds for bass fishing, locations of northern pike and tiger muskie stockings, locations of mandatory check stations for deer hunters, and locations for check stations for submitting entries to the Massachusetts Freshwater Sportfishing Awards program. Among these "regular" publications, are maps of over 200 ponds and waterways and of 45 wildlife management areas. Because of the increasing cost of printing and paper, a nominal charge--five free, others five cents each--was set for these maps which had been available previously without cost. To further assist anglers, the Section published new maps and notes developed through fisheries surveys. These maps were bound by district (eight to twelve maps per district) and offered for sale at 50 cents apiece. The first set (five booklets) became available in 1980; the second became available in 1981. Angler response was enthusiastic and the Section experienced some difficulty in keeping up with the demand.

Demand was also high for publications which expanded two series initiated during FY1979. Listings and records of abundance were provided for Reptiles and Amphibians of Massachusetts by James C. Cardoza and Peter Mirick and for Freshwater Fish of Massachusetts by David Halliwell. The series of natural history flyers was expanded to include the bald eagle, shad, Atlantic salmon, chickadees, white-tailed deer, snipe, bullfrogs, and bullheads, and a special flyer was produced to assist cub scouts in meeting the requirements for the wildlife merit badge. As supplies of most of these publications were only moderate, stocks were depleted rapidly and reprinting became an ongoing project. Reprinting was also necessary for the fishing flyer printed in cooperation with the Boston Globe and distributed through the Massachusetts Division of Fisheries and Wildlife offices and at shows. A full revision of the flyer is underway and completion is expected in FY1982. Supplies of the Sportsmen's Guide to the Quabbin Area, published in cooperation with the Metropolitan District Commission, were also exhausted. A second edition was printed in FY1980 and as those are already out of date and virtually gone, a third edition, fully updated, is planned for FY1982.

To keep up with the increased number of publications and the increase in requests for publications, it became necessary to issue a list of publications available from the Division. Such a list was first printed in FY1980 and was revised in FY1981.

Publication of the series "Wildlife Portraits" was halted as a result of increasing costs and relatively lim ited use. The series remains available to newspapers and/or educators for the price of duplication and handling. Despite this, numerous wildlife articles were prepared for publication in magazines and newspapers, especially papers of the Beacon chain, the Outdoor Message and Massachusetts Out-of-Doors. In this, the Section was aided materially by the services of three interns: Sharon Dean, Louise Sharples and Gary Goldenberg in FY1980 and by intern Bill Davis in FY1981.

Massachusetts Wildlife continued as the Division's most visible and popular publication. As a result of escalating costs, it was published, however, only four times a year rather than six. The subscription list continued to grow to a record high of 42,000 in early 1981. This was a mixed blessing in view of rising postal costs. In February 1981, the Division staff and Massachusetts Wildlife readers were jolted by the sudden death of Managing Editor Jack Clancy. In March, the management of the magazine passed to Peter Mirick who has maintained the high quality of the magazine and has initiated a program to update the subscription list.

Along with an increasing demand for publications, there has been an increasing demand for photographs. Thus, during FY1980 and 1981, Audio-Visual Coordinator Jack Swedberg worked with CETA trainee, Barbara Terkanian and YACC employee Ann Youngstrom. Together, they completed a color coding of some 20,000 color transparencies and completed a cross-indexed file of an estimated 35,000 black and white negatives. These pictures as well as a library of film clips are now accessible. Still pictures and film are added as time permits. The pictures and films are used by Division biologists in presentations, in Division publications, in public press and on many major TV stations. Staff members appeared on and provided film footage for a variety of TV shows ranging from news to panel shows to magazine format shows such as Bill O'Connell's sports on Channel 7 and the Jack Woolner show on Channel 27.

During FY1981, a number of long-term projects produced visible results. Audio-Visual Coordinator Swedberg initiated contact with the Pittsfield branch of General Electric Company which has, in turn, expressed an interest in revising and producing the Division's 22-minute film, "Massachusetts Wildlife" with a mixed optical sound track and professional narration. GE would provide a print of the completed film to each wildlife district and two to Field Headquarters. Film prints would then be available for loan or purchase through the Massachusetts Division of Fisheries and Wildlife. Completion of this project is anticipated in fall of 1981.

Photography was completed for a film story on the life of herons in Massachusetts. This project, in progress for the past few years, also has an outside sponsor. Production and distribution will be handled by the private funding group and completed prints will be donated to the Division. A similar arrangement has been made for a film on the Merrimack River and for a slide show for youngsters on wildlife in Massachusetts. Both of these last are still in progress. Also nearing completion is a slide show on the Massachusetts Junior Conservation Camp. It is hoped that external sponsors will be available to cover the cost of duplication of materials and distribution.

In a somewhat unusual service project, Division photographers photocopied the entire collection of paintings by Louis Agassiz Fuertes, presently housed in the State House Archives. Four by five color negatives and transparencies were made of 91 of the original 93 paintings--two of the original paintings are missing. It is hoped that a limited edition of full-sized lithographs can be prepared from these negatives and offered for sale.

During the reporting period, Section personnel made an average of 75 live appearances each year addressing class groups, civic groups and sportsmen's organizations, and representing the Division at a variety of annual meetings. Many of these contacts involved actual teaching either in Division headquarters or at schools. In some cases, staff members became involved in summer camp programs, most notably conservation camp programs in Marlboro and Berlin. In addition, the Division continued to bear major responsibility for administration and teaching at the Massachusetts Junior Conservation Camp, now in its thirty-second and thirty-third years. Additionally, pilot programs were launched into the area of adult education. One such program was held in Winchendon during 1980, another was held in Pittsfield in 1981. Although enrollees proclaimed the course worthwhile, the outreach was small for effort expended and there are no plans to continue such courses in 1982.

Other responsibilities involved the Section in promoting and administering the Freshwater Sportfishing Awards program under which anglers were recognized for outstanding catches in any of 20 categories. New categories added during this reporting period included carp, white catfish and tiger muskies.

Special certificates were designed and prepared in 1980 to recognize hunters who took outstanding deer.

An additional promotional program was introduced in 1980 under the title, "Sponsor a Pond." Under this program, participating groups could sponsor a number of tagged trout by obtaining prizes to correspond to each tag. Ten groups participated during the first year, placing 250 tagged fish and obtaining a return rate of about 70 percent. Twenty-five groups put out 650 tagged fish in an expanded 1981 version of the program called "Tags 'n' Trout." Again response rate was high with some sponsors reporting that 90 percent of the tags had been returned. Prizes ranged from fishing tackle to down clothing and even a canoe.

Another promotional program initiated in 1980 involved production of a special Christmas envelope and promotion of licenses as Christmas gifts. The program and the decorative envelopes were well received.

Selection of designs for and production of the Commonwealth's waterfowl stamp took on new proportions as the competition--in its eighth and ninth years--drew 54 and 60 entries from all over the nation, an increase of almost 100 percent over 1979. The location of the judging was moved from the Division's Boston office to the Peabody Museum, Salem where all entries remained on display for a week.

The design for the archery/primitive firearms stamp continued to be commissioned. The 1980 design was prepared by Barbara Terkanian of Concord; the 1981 design was a donation by Randy Julius of East Bridgewater, winner of the 1979 and 1981 waterfowl stamp contests.

Displays were designed and built for the major sportsmen's shows, each aimed at drawing attention to some area of interest in Massachusetts' wildlife scene. Thus, the 1980 exhibit at the Eastern States Exposition, the Boston Sportsmen's Show and the Boxborough fishing exposition focused on the restoration of the wild turkey. Live animals were shown in a specially-constructed display; specially-produced materials told about the subjects and their current status. Exhibits in 1981 drew attention to white-tailed deer (increasing in numbers and health on decreasing range) and on the coyote (newest member of our wildlife scene). Other displays during the year focused on the Division's various activities. A large display area was arranged at the entrance to the Division's Boston office and it has housed a succession of exhibits dealing with wildlife, hunting, fishing and wildlife art.

Arrangements--and where needed, programs--were made for Board meetings and public hearings, and for such special events as the swearing in of Director Richard Cronin and a tour of McLaughlin Hatchery by Governor Edward J. King. Special events included dedication of wildlife management areas honoring Martin Burns, Hiram Fox and Eugene Moran, in 1980, and Erwin Wilder, in 1981, and dedication of the Roger Reed Salmon Hatchery. Section personnel also coordinated activities related to National Hunting and Fishing Day.

In addition to the assortment of projects already outlined, the Information and Education staff reviewed and revised the policy statement as it relates to information and education activities and submitted budget proposals for FY1982 and FY1983.

REALTY

Floyd Richardson
Chief of Wildlife Lands

The Realty Section is charged with the responsibility of locating lands in areas where wildlife lands are needed or in areas where acquisition would enhance existing wildlife lands. This involves initial identification of suitable areas, negotiation and carrying out all operations pertinent to land purchase. It also includes supervising any land transfers involved in providing land gifts to the Division. At the present time, the Division controls more than 44,000 acres. During FY-1980, the Realty Section secured almost 1,000 acres of new wildlife lands, some by purchase, some by transfer, some by gift. Budget cuts in FY-1981 severely reduced the Division's purchasing power; nevertheless, the Section secured an additional 175 acres of land for wildlife.

FY-1980

Bolton Flats Acquisition Project, 661.9 acres. An additional 6.8 acres of land was added to this popular area. The property purchased was an interesting composite of pasture lands and marsh, embracing the Still River in the Town of Bolton. Although small in size, the acquisition contributes significantly to the area.

Hockomock Acquisition Project, 4,832.7 acres. This particular acquisition had been in "limbo" since 1974. Title problems compounded with probate procedures finally were resolved, allowing the purchase of 50 important Hockomock acres.

Its position relative to other Division lands and Route 24 increased the importance of this acquisition which was finally completed on 24 June of this year.

Housatonic River Acquisition Project, 702.1 acres. These 40 acres came to the Division, a gift from Mr. and Mrs. Arthur Stein. Their generous contribution is gratefully acknowledged.

This valuable wildlife land, commonly known as bottom land, is characterized by growth of aspen, cherry, maple and willow trees, and is accented by brushlands and occasional marshlands. The donated land contributes another segment of river corridor, continuing a program initiated in 1969 to provide and preserve wildlife lands along the Housatonic River.

Quaboag Wildlife Acquisition Project, 1,042.1 acres. Although this acquisition is relatively small in size (less than six acres), this irregularly-shaped lot extends to the river's edge. It fills an important niche, providing additional public land on the Quaboag River in the Town of Brookfield.

Muddy Pond Project, 72.0 acres. Muddy Pond, located in the Town of Carver, is a manmade and privately-owned pond built to furnish water for cranberry bogs. The acquisition of this 72-acre pond provides the sportsmen a fishing area for all times. This acquisition could not have occurred without the cooperation of the Board of Selectmen and the foresightedness of the inhabitants of the Town of Carver. The town voted by warrant to provide this Division with an easement across town land for access to the pond in addition to an area for parking.

Minns Sanctuary, 1.0 acres. Dr. Olive Gates donated an acre of land abutting the Minns Wildlife Sanctuary. She had previously donated another parcel to the agency in 1976.

Parker River Acquisition Project, 730.0 acres. Twenty-six acres of land fronting on Hay Street in the Town of Newbury were added to this management area which has afforded the public a wide variety of recreational opportunities.

North Shore Salt Marsh Acquisition Project, 415.9 acres. The Nature Conservancy donated 20 acres in the Salisbury marshes, bringing Division holdings in the area to 415 acres. Four parcels of property within the marshes will provide waterfowlers with huntable lands in public ownership.

Downfall Acquisition Project, 1,480.9 acres. This acquisition of 38.5 acres abutting the Downfall Wildlife Management area both enlarges and complements this heavily-used management area.

Gosnold Acquisition Project, 3.5 acres. The General Services Administration of the United States of America transferred ownership of a parcel of land on Cuttyhunk to the Division. This transfer is cost-free.

Phillipston Acquisition Project, 2,747.7 acres. Northwest of the existing Phillipston Wildlife Management Area, a satellite management area of 735 acres was conveyed to this Division during this fiscal period. Extensive road frontage along Route 101 was but one of the numerous benefits of this purchase. The East Branch of the Swift River has its beginning in a valley extending through the middle of the property. Lumbering operations, past and present at this site, have improved conditions for wildlife. The removal of the mature trees eliminated crown cover, allowing the sun to reach the forest floor. This, in turn, accelerated vegetative growth, providing food and cover for wildlife. Sportsmen and the recreationists alike will appreciate this new addition.

FY-1981

Housatonic River Acquisition Project, 782.2 acres. Two additional acquisitions to this area assisted in fulfilling the planned objective of providing a publicly-owned corridor of land along the Housatonic River. This corridor now extends from South Street, Pittsfield, to Woods Pond in Lee. Including lands owned by the City of Pittsfield, Audubon, and the Town of Lenox, 1000-plus acres are now available for public use.

Birch Hill Acquisition Project, 3,097.1 acres. A 70-acre parcel, with frontage on New Boston Road in the Town of Royalston, was acquired. This land is contiguous to the Division's Birch Hill area. Lumbering operations of the past have accelerated woody sprout growth providing abundant food and cover for wildlife.

Nissitissit River Acquisition Project, 294.1 acres. This acquisition in Pepperell provides public access to the Nissitissit River via Prescott Street and insures river access for fishermen and parking.

North Shore Salt Marsh Acquisition Project, 425.9 acres. A gift of ten acres, more or less, was presented to the Division by Mrs. Lillian D. Herrick. The land, a mixture of marshland and upland, abuts other lands in Fisheries and Wildlife ownership in the Town of Ipswich.

Pantry Brook Acquisition Project, 410.9 acres. An area well known to waterfowlers located in the Town of Sudbury was increased in acreage by an acquisition of 10 additional acres. The property purchased contributes prime nesting cover for many species of upland game.

Crane Pond Acquisition Project, 2,108.0 acres. Called the "Hale Sprout Land," this acquisition filled a void in contiguous Division ownership. Although 3.5 acres seem insignificant, the purchase guarantees public land status for the area for all time, and so protects the integrity of the rest of the Crane Pond area .

Concord River Acquisition Project, .25 acres. Access to the Concord River is afforded by this property. Canoe and cartop boats can be launched directly into the river to accommodate fishing enthusiasts. The property, with its 100 feet of stream frontage, is located in Billerica adjacent to Route 4 in a section known as Rio Vista.

Summary of Land Acquisition

Fiscal Year 1980

Area Name	Town		Acreage
Bolton Flats	Bolton		6.80
Quaboag Area	Brookfield		5.70
Parker River	Newbury		26.00
Minns Sanctuary	Princeton		1.06
Phillipston Area	Phillipston/Petersham		735.00
Muddy Pond	Carger		71.00
Housatonic Area	Pittsfield		40.40
Gosnold Area	Cuttyhunk		3.45
Hockomock	Bridgewater		50.00
North Shore Marshes	Salisbury		20.00
Downfall Area	Newbury		38.50
		Total	998.91

Fiscal Year 1981

Area Name	Town		Acreage
Birch Hill	Royalston		70.00
Crane Pond	Groveland		3.50
Housatonic River	Pittsfield		80.11
North Shore Marshes	Ipswich		10.00
Nissitissit Area	Pepperell		.50
Pantry Brook	Sudbury		10.30
Concord River Area	Billerica		.25
		Total	174.66

Maintenance & Development

John P. Sheppard
Chief of Maintenance and Development

Some of the activities of this section have already been mentioned under hatchery and game farm improvement activities. A summary of engineering and development during FY 1980 and 1981 is noted here.

Hatcheries

A 150-foot by 50-roof roof over the Atlantic salmon pools at the Roger Reed Hatchery, Palmer, has been completed, security fencing was installed and, in 1981, test and observation wells were drilled, tiger muskie tanks were installed, and contracts were awarded for a 12-inch deep well and deep well turbine pump.

Work began on a new facility for raising coho salmon and sea-run brown trout at the East Sandwich station of the Sandwich Fish Hatchery. Construction began on an extensive underground water supply and drainage system, and specifications were designed and contracts awarded for a new hatch house, a roofing structure, security fencing, a two-stage vertical pump and bowl assembly, redevelopment of the existing well, 15 exterior and 18 interior tanks.

During this period, site preparation activities at East Sandwich were completed along with the filling of old raceways and planting of 100 American arborvitae.

Another two-stage vertical pump and bowl assembly was installed at the McLaughlin hatchery in Belchertown.

Game Farms

A new electrical system was installed in the hatch house at the Ayer Game Farm and a new heating system was installed in the residence on the Ayer farm grounds. At the Wilbraham Game Farm, cut-back asphalt was procured and applied to existing roads.

Districts and Management Areas

The water system at Northeast District Headquarters was repaired and an alarm system was installed at the Southeast District Headquarters.

A new access road and parking area were constructed at the Martin Burns Wildlife Management Area, Newbury. Heavy metal security gates were installed at the Westboro Field Trial and Management Area. This proved sufficiently successful that in 1981 other structural steel gates were installed on other Division lands.

Other

Vapor recovery systems were installed on many of the existing fuel storage systems in use at Division installations.

The Engineering Section also provided technical assistance to other agencies within the Department including assistance to the Public Access Baord for boat ramps on the Charles River, Waltham; Moosehorn Pond, Hubbardston; Comet Pond, Hubbardston, and a public access facility at the Parker River, Newbury.

Personnel Action

Fiscal Year 1980

Retirements

Name	Job Title	Date
H. Dufault	Conservation Skilled Helper	12/01/79

Resignations

M. Barr	Junior Clerk	08/30/79
B. Dobson	Senior Clerk-Typist	04/05/80
R. Garabedian	Conservation Helper	02/09/80
C. Keane	Junior Clerk-Stenographer	09/08/79
J. Marini	Conservation Helper	01/26/80
T. Palermo	Assistant Aquatic Biologist	09/17/79
J. Pottie	Assistant Game Biologist	08/11/79
T. Taylor	Conservation Helper	11/10/79
R. York	Conservation Helper	09/01/79

Appointments

A. Aittaniemi	Assistant Game Culturist	08/26/79
K. Corey	Conservation Helper	10/14/79
K. Hickey	Conservation Helper	11/11/79
L. Hollings	Unit 2 - return to permanent position	12/30/79
J. Kostro	Unit 2 - return to permanent position Conservation Skilled Helper	12/30/79
E. Kraus	Conservation Skilled Helper Reinstated from YACC	06/29/80
E. Mitchell	Permanent reassignment - Head Clerk	07/01/79
N. Pratt	Conservation Helper	09/04/79
M. Rosenfeld	Conservation Helper	12/30/79
E. Siwicki	Conservation Helper	11/11/79

Promotions

B. Blodget	Assistant Director of Nongame and Endangered Species	10/28/79
R. Keller	Assistant Aquatic Biologist	09/23/79
W. Neale	Conservation Skilled Helper	12/31/79
C. Prescott	Superintendent of the Bureau of Wildlife Research and Management	08/26/79

Personnel Action

Fiscal Year 1981

Retirements

Name	Job Title	Date
M. Lane	Conservation Helper	02/28/81

Deceased

J. Clancy	Wildlife Journalist	02/20/81

Resigned

M. Fillion	Conservation Helper	07/25/80
S. Early	Conservation Helper	01/04/80
P. Cameron	Conservation Helper	09/04/80
E. Bennett	Conservation Helper	09/04/80
C. Nazzaro	Junior Clerk-Typist	09/04/80
C. Lee	Conservation Helper	08/16/80
E. Sienczk	Senior Clerk-Stenographer	07/12/80
L. (Champa) Izbicki	Junior Clerk-Typist	09/20/80
P. Salie	Conservation Skilled Helper	09/29/80
K. Hely	Junior Clerk-Typist	10/31/80
S. Lonergan	Conservation Helper	11/21/80
D. Kelly	Junior Clerk-Typist	11/17/80
A. Duffy	Senior Clerk	11/03/80
J. Starrett	Conservation Skilled Helper	10/30/80
J. Rozkuszka	Conservation Helper	12/27/80
D. LeBlanc	Assistant Fish Culturist	01/10/81
N. Melito, II	Junior Clerk-Stenographer	12/26/80
J. Holt	Conservation Helper	01/21/81
J. Morash	Ornithologist	02/11/81
J. Holland	Senior Clerk-Typist	03/13/81
J. Dascoli	Conservation Helper	02/28/81
L. (Champa) Izbicki	Junior Clerk-Typist	04/14/81
M. Rosenfeld	Conservation Helper	05/01/81
J. Jonasch	Assistant Aquatic Biologist	05/03/81
P. Collins	Conservation Helper	05/03/81

Appointments

M. Brazauskas	Conservation Helper	11/09/80
C. McEvoy	Senior Clerk-Typist	08/03/80
L. (Champa) Izbicki	Junior Clerk-Typist	08/31/80
L. (Champa) Izbicki	Junior Clerk-Typist	11/09/80
I. Howard	Senior Clerk-Stenographer	09/07/80
J. Dascoli	Conservation Helper	09/15/80
K. Hely	Junior Clerk-Typist	09/22/80
R. Thomasian	Conservation Helper	10/27/80
D. Viera	Conservation Helper	11/24/80
N. Melito, II	Junior Clerk-Stenographer	09/23/80
S. Townsend	Conservation Helper	09/29/80
J. Almeida	Conservation Helper	09/29/80
J. Holt	Conservation Helper	09/14/80

Appointments (Cont.)

Name	Job Title	Date
D. Spigarolo	Conservation Helper	12/28/80
P. Nelson	Conservation Helper	02/22/81
D. Chesmore	Senior Clerk	03/01/81
D. D'Angelo	Junior Clerk-Typist	02/09/81
E. Pignatello	Junior Clerk-Typist	02/09/81
M. Masley	Assistant Fish Culturist	01/19/81
T. Staples	Fish Cultuirst	04/12/81
A. Pellegri	Conservation Helper	04/12/81
E. Richard	Junior Clerk-Typist	05/17/81
P. Sutcliff	Junior Clerk-Typist	11/10/80

Reappointments

C. Zobka	Assistant Fish Culturist	04/12/81
J. Skowron	Conservation Skilled Helper	04/12/81
E. Bolduc	Conservation Helper	04/12/81
I. Howard	Conservation Helper	01/18/81

Transfers

G. Galas	Conservation Helper, Connecticut Valley District	10/12/80
D. Bielicki	Conservation Helper, Wilbraham Game Farm	10/12/80

Promotions

R. Wheeler	Conservation Skilled Helper	12/07/80
C. McEvoy	Senior Clerk-Stenographer	01/25/81
P. Mirick	Wildlife Journalist	03/16/81
E. Pignatello	Senior Clerk-Typist	03/29/81
K. Corey	Assistant Aquatic Biologist	06/07/81

Transfers from YACC Program

M. Wrubel	Conservation Helper	06/29/81
W. Dauderis	Leave of Absence	01/26/81
E. Kraus	Conservation Skilled Helper	06/28/81
C. Ayers	Conservation Helper	06/28/81
D. Carlson	Conservation Skilled Helper	06/29/81

Legislation

Enacted During Fiscal Years 1980 and 1981

Chapter 404 - Acts of 1979. An Act Relative to the Hunting of Wild Turkeys.

Effective 18 October 1979

Chapter 587 - Acts of 1979. An Act Increasing the Fee for a Duplicate Sporting, Hunting, Fishing or Trapping License.

Effective 31 December 1979

Chapter 614 - Acts of 1979. An Act Relative to Reptiles and Amphibians.

Effective 3 January 1980

Chapter 618 - Acts of 1979. An Act Providing for the Sale of the Western Wildlife District Headquarters, so-called, by the Division of Fisheries and Wildlife.

Effective 3 January 1980

Chapter 726 - Acts of 1979. An Act Providing for the Listing of Endangered Wildlife and Wild Plant Species.

Effective 11 February 1980

Chapter 767 - Acts of 1979. An Act Amending License Fees for Hunting, Fishing, and Trapping.

Effective 1 January 1980

Chapter 84 - Acts of 1980. An Act Relative to Registration and Identification of Traps. Under this act, the Director shall provide by regulation that the registration numbers and name of the owner of a trap be affixed to each trap.

Effective 1 January 1981

Chapter 154 - Acts of 1980. An Act Further Regulating Rules and Regulations Relative to Great Ponds. (Any rules established by a town regulating hunting and fishing in great ponds must be approved by the Director of the Massachusetts Division of Fisheries and Wildlife.)

Effective 30 August 1980

Chapter 391 - Acts of 1980. An Act Directing the Division of Fisheries and Wildlife to Grant an Easement over a Certain Parcel of Land in the Town of Montague for Sewerage Purposes.

Effective 7 July 1980

Chapter 572 - Acts of 1980. An Act Authorizing the Commissioner of Administration to Set Fees and Charges Paid to the Commonwealth.

Effective 1 July 1980; expires 31 December 1982

HOW THE SPORTSMAN'S DOLLAR IS SPENT

Nancy A. Melito
Head Administrative Assistant

At the close of the 1980 fiscal year, there was a deficit of $677,449 in the Inland Fish and Game Fund. Our prime concern in the 1981 fiscal year was to curtail rising operational costs wherever possible and explore the possibility of additional sources of revenue.

In the course of the year, two major developments occurred which considerably augmented our income--an 11.5 percent increase in license purchases and recovery of indirect cost monies totalling $702,632, applicable to fiscal years 1978 through 1981. Consequently, through careful management of operations and additional revenues realized, the deficit was reduced by 90 percent to $66,885.

COMMONWEALTH OF MASSACHUSETTS
DIVISION OF FISHERIES AND WILDLIFE
Fiscal Year July 1, 1980 to June 30, 1981

"HOW THE SPORTSMEN'S DOLLAR WAS SPENT"

	Account No.	Expenditures	Percentage
Administration			
Administration	2310-0200	495,060.56	
Information-Education	2310-0200	121,565.03	
		616,625.59	12.86%
Fisheries Programs			
Fish Hatcheries	2310-0600	799,297.84	
**Fisheries Management	2310-0600	511,024.34	
Fisheries Cooperative Unit	2310-0600	18,000.00	
		1,328,322.18	27.70%
Wildlife Programs			
Game Farms	2310-0400	603,366.44	
**Wildlife Management	2310-0400	612,670.39	
Wildlife Cooperative Unit	2310-0400	18,000.00	
		1,234,036.83	25.73%
Land Acquisition			
***Acquisition of Upland Areas and Inholding on Existing Areas	2310-0310	49,939.94	1.04%
Engineering and Construction			
*Development and Improvement of Facilities for Public Use	2310-0300	74,971.84	1.56%
Equipment			
Purchase of Equipment	2310-0315	72,130.71	1.50%
Secretary, Environmental Affairs			
Office of Secretary (3%)	2000-0100	9,464.65	.20%
Department of Fisheries, Wildlife and Recreational Vehicles			
Commissioner's Office (50%)	2300-0100	61,577.44	1.28%
Department of Environmental Management			
Natural Resource Officers' Salaries and Expenses (30%)	2020-0100	394,468.14	8.23%
**Hunter Safety Training (100%)	2020-0300	61,607.87	1.28%
Transfers from Fund			
Group Insurance	1590-1007	202,349.98	
Salary Adjustments		85,361.00	
Fuel Oil Adjustments		5,500.00	
Tiger Muskie Program		50,500.00	
Settlement of Certain Claims		1,500.00	
		345,210.98	7.20%
Retirement			
Assessment	0612-1000	242,085.51	5.05%
Interest on Bonded Debt	0699-2800	70,463.75	1.47%
Maturing Serial Bonds and Notes	0699-2900	165,000.00	3.44%
Increase in Continuing Accounts Brought Forward		70,213.46	1.46%
		$4,796,118.89	100.00%

* Continuing Appropriation

** Portions of expenditures 60% or 75% reimbursable by Federal Government.

*** " " " are 50% " " " "

APPROPRIATIONS AND EXPENDITURES
Fiscal Year July 1, 1980 to June 30, 1981

ACCOUNT NO.	TITLE	APPROPRIATIONS	EXPENDITURES & LIABILITIES	TOTAL REVERSONS
2310-0200	Administration	627,129.00	616,625.59	10,503.41
2310-0310***	Acquisition of Upland Areas and Inholding on Existing Areas	50,000.00	49,939.94	60.06
2310-0315	Purchase of Equipment	75,000.00	72,130.71	2,869.29
2310-0400**	Wildlife Management	1,237,076.00	1,234,036.83	3,039.17
2310-0600**	Fisheries Management	1,346,432.00	1,328,322.18	18,109.82
		3,335,637.00	3,301,055.25	34,581.75
		CONTINUING APPROPRIATIONS	EXPENDITURES	BALANCE FORWARD
2310-0300*	Development & Improvement Facilities for Public Use	139,339.64	74,971.84	64,367.80
2670-9016**	Acquisition of Coastal & Inland Wetlands	34,354.34	14,308.85	20,045.49
2670-9022	Fish Screens, Quabbin	4,020.37	-	4,020.37
		177,714.35	89,280.69	88,433.66

*Continuing Account

**Portions of expenditures 69%Or 75% reimbursable by Federal Government.

*** Postions of expenditures are 50% reimbursable by Federal Government.

SUMMARY OF FISH AND WILDLIFE INCOME
July 1, 1980 to June 30, 1981

*Fishing, Hunting and Trapping Licenses	3304-61-01-40	3,360,174.10
*Trap Registrations	3304-61-01-40	1,390.00
*Archery/Primitive Firearms Stamps	3304-61-01-40	71,636.70
*Waterfowl Stamps	3304-40-01-40	6,594.00
*Waterfowl Stamps - Ducks Unlimited	3304-40-02-40	20,632.00
**Special Licenses, Tags and Posters		10,845.05
Antlerless Deer Permits	3304-61-14-40	9,830.90
Turkey Permit Applications	3304-61-14-40	2,986.06
Turkey Permits	3304-61-14-40	11,305.00
Bear Permits	3304-61-14-40	1,101.00
Rents	3304-63-01-40	18,523.11
Miscellaneous Income	3304-69-99-40	3,302.65
Sales, Other	3304-64-99-40	29,554.04
Refunds Prior Year	3304-69-01-40	4,746.55
Court Fines and Penalties	3308-41-01-40	22,563.99
Pittman-Robertson Federal Aid	3304-67-01-40	446,776.51
Dingell-Johnson Federal Aid	3304-67-02-40	220,146.64
Anadromous Fish Projects Federal Aid	3304-67-04-40	35,718.96
Indirect Cost Reimbursement	3304-67-67-40	561,311.96
Interest on Investments	3395-60-01-40	-
Gasoline Tax Apportionment	3312-05-01-40	330,842.92
Transfers from General Fund:		
Salary Adjustment	3360-95-02-36	85,361.00
Reimbursement on half-price licenses	3360-95-08-40	47,340.30
Fuel Oil Adjustment	3360-95-09-36	5,500.00
Tiger Muskie Program	3360-95-09-36	50,500.00
Accounts Payable Reversions		47,053.79
		5,405,737.23
Deficit in Inland Fish and Game Fund as of June 30, 1981		66,885.30

*See Detail Sheet #1
**See Detail Sheet #2

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DIVISION OF FISHERIES AND WILDLIFE
RECEIPTS FROM FISHING, HUNTING AND TRAPPING LICENSES
Fiscal Year July 1, 1980 to June 30, 1981

Type of License Series		Price	Quantity	Gross Amount	Fees Retained by Clerks	Net Returned to State
01	Res. Cit. Fishing	11.25	130,763	1,471,083.75	26,970.50	1,444,113.25
02	Res. Cit. Hunting	11.25	47,699	536,613.75	10,554.50	526,059.25
03	Res. Cit. Sporting	16.50	63,416	1,046,364.00	13,333.00	1,033,031.00
04	Res. Cit. Minor Fishing	6.25	10,237	63,981.25	2,171.00	61,810.25
05	Res. Alien Fishing	14.25	1,189	16,943.25	260.75	16,682.50
06	Non Res. Cit./Alien Fishing	17.25	4,301	74,192.25	824.00	73,368.25
07	Non Res. Cit./Alien 7 da. Fish.	11.25	2,062	23,197.50	374.25	22,823.25
08	Non Res. Cit./Alien Hunting (Small Game)	23.25	918	21,343.50	207.50	21,136.00
09	Non Res. Cit./Alien Comm. Shooting Pres. 3 da. Hunting	19.25	30	577.50	7.50	570.00
10	Res. Cit. Minor Trapping	6.25	457	2,856.25	105.00	2,751.25
11	Res. Cit. Trapping	14.50	1,201	17,414.50	276.00	17,138.50
12	Duplicates	2.00	3,635	7,270.00	-	7,270.00
13	Res. Alien Hunting	19.25	1,296	24,948.00	276.00	24,672.00
14	Non Res. Cit./Alien Hunting (Big Game)	38.25	1,017	38,900.25	233.50	38,666.75
15	Res. Cit. Sporting (over 70)	FREE	21,027			
16	Res. Cit. Fishing (Blind, Paraplegic, Mentally Ret.)	FREE	1,582			
17	Res. Cit. Hunting (Paraplegic)	FREE	140			
18	Res. Cit. Fishing (Age 65-69)	5.75	6,894	39,640.50	1,631.00	38,009.50
19	Res. Cit. Hunting (Age 65-69)	5.75	685	3,938.75	163.75	3,775.00
20	Res. Cit. Sporting (Age 65-69)	8.25	3,070	25,327.50	725.75	24,601.75
21	Res. Cit. Trapping (Age 65-69)	7.25	91	659.75	22.00	637.75
			301,710	3,415,252.25	58,136.00	3,357,116.25
22	Archery/Primitive Firearms Stamp	5.10	14,287	72,863.70	1,227.00	71,636.70
			315,997	3,488,115.95	59,363.00	3,428,752.95
	1981 licenses-Town of Bridgewater; cards lost; could not be analyzed			445.00	-	445.00
	1979 license fees collected		246	2,664.35	51.50	2,612.85
	Trap Registrations*			1,390.00	-	1,390.00
			316,243	3,492,615.30	59,414.50	3,433,200.80
23	Mass. Waterfowl Stamps	1.25	25,840	32,300.00	5,074.00	27,226.00
			342,083	3,524,915.30	64,488.50	3,460,426.80

* Trap Registrations				
	Initial:	305	@ 2.00	$610.00
	Renewal:	512	@ 1.50	768.00
	Dupes:	6	@ 2.00	12.00

SPECIAL LICENSES, TAGS AND POSTERS
July 1, 1980 to June 30, 1981

Receipt Acct.	Type of License	Quantity & Unit Price	Amount	Receipt Account Total
3304-61-02-40	Fur Buyers			
	Resident Citizens:	32 @ 15.00	480.00	
	Non-Residents or Aliens:	4 @ 50.00	200.00	680.00
3304-61-03-40	Taxidermists:	100 @ 10.00	1,000.00	
		1 @ 1.00	1.00	1,001.00
3304-61-04-40	Propagators			
	Special Purpose Permits:	122 @ 1.00	122.00	
	Class 1 (Fish)			
	Initial:	20 @ 7.50	150.00	
	Renewal:	144 @ 5.00	720.00	
	Class 3 (Fish)			
	Initial:	12 @ 7.50	90.00	
	Renewal:	74 @ 5.00	370.00	
	Class 4 (Birds,Mammals,Amphibians)			
	Initial:	119 @ 7.50	892.50	
	Renewal	513 @ 5.00	2,565.00	
	Class 6 (Dealers)			
	Initial:	13 @ 7.50	97.50	
	Renewal:	56 @ 5.00	280.00	
	Additional:	155 @ 1.50	232.50	
	Class 7 (Individual Bird or Mammal)			
	Initial:	9 @ 3.00	27.00	
	Renewal:	35 @ 1.00	35.00	
	Importation Permits			
	Fish:	2 @ 5.00	10.00	
	Birds or Mammals	38 @ 5.00	190.00	
	Class 9 (Falconry)			
	Master:	5 @ 25.00	125.00	
	Apprentice:	12 @ 25.00	300.00	
	General:	7 @ 25.00	175.00	
	Class 10 (Falconry)			
	Raptor Breeding:	1 @ 10.00	10.00	
	Class 11 (Falconry)			
	Raptor Salvage:	6 @ 1.00	6.00	6,397.50
3304-61-05-40	Take Shiners:	128 @ 5.00	640.00	
	Duplicates	2 @ 2.00	4.00	644.00
3304-61-06-40	Field Trial Licenses:	6 @ 15.00		90.00
3304-61-07-40	Taking of Eels:	15 @ 25.00		375.00
3304-61-08-40	Quail to Train Dogs			
	Initial:	5 @ 7.50	37.50	
	Renewal:	25 @ 5.00	125.00	162.50
3304-61-10-40	Commercial Shooting Preserves:	8 @ 50.00		400.00
3304-61-12-40	Mounting Permits:	18 @ 2.00		36.00
3304-61-13-40	Special Field Trial Permits:	25 @ 15.00		375.00
3304-64-01-40	Tags and Posters			
	Fish Tags:	10,750 @ .02	215.00	
	Game Tags:	9,011 @ .05	450.55	
	Posters:	370 @ .05	18.50	684.05
				$10,845.05

SUMMARY OF FISH AND WILDLIFE INCOME

July 1, 1979 to June 30, 1980

*Fishing, Hunting and Trapping Licenses	3304-61-01-40	$2,714,534.55
*Trap Registrations	3304-61-01-40	1,556.50
*Archery Stamps	3304-61-01-40	52,189.40
*Waterfowl Stamps	3304-40-01-40	7,438.30
*Waterfowl Stamps - Ducks Unlimited	3304-40-02-40	22,925.70
**Special Licenses, Tags and Posters		10,440.99
Antlerless Deer Permits	3304-61-14-40	9,496.55
Bear Permits	3304-61-14-40	437.50
Turkey Permit Applications	3304-61-14-40	2,188.00
Turkey Permits	3304-61-14-40	5,385.00
Rents	3304-63-01-40	16,837.20
Miscellaneous Income	3304-69-99-40	1,083.45
Sales, Other	3304-64-99-40	11,399.46
Refunds Prior Year	3304-69-01-40	487.27
Court Fines and Penalties	3308-41-01-40	17,097.90
Pittman-Robertson Federal Aid	3304-67-01-40	567,976.72
Dingell-Johnson Federal Aid	3304-67-02-40	268,332.85
Anadromous Fish Projects Federal Aid	3304-67-04-40	67,408.96
Interest on Investments	3395-60-01-40	240.00
Gasoline Tax Apportionment	3312-05-01-40	299,709.00
		$4,077,165.30

- - - - - - - - - - - - - - - - - -

Deficit in Inland Fish and Game Fund as of June 30, 1980	$677,449.00

*Detail Sheet No. 1

**Detail Sheet No. 2

COMMONWEALTH OF MASSACHUSETTS
DIVISION OF FISHERIES AND WILDLIFE
Fiscal Year July 1, 1979 to June 30, 1980

"HOW THE SPORTSMEN'S DOLLAR WAS SPENT"

	Account No.	Expenditures	
Administration			
Administration	2310-0200	472,540.53	
Information-Education	2310-0200	142,949.54	
		615,490.07	13.29%
Fisheries Programs			
Fish Hatcheries	2310-0600	729,508.31	
** Fisheries Management	2310-0600	505,100.49	
Fisheries Cooperative Unit	2310-0600	15,000.00	
		1,249,608.80	26.99%
Wildlife Programs			
Game Farms	2310-0400	552,753.07	
** Wildlife Management	2310-0400	517,925.31	
Wildlife Cooperative Unit	2310-0400	15,000.00	
		1,085,678.38	23.45%
Land Acquisition			
* ***Acquisition of Upland Areas and Inholding on Existing Areas	2310-0310	76,454.82	
* ***Coastal and Inland Waters Acq.	2670-9016	175,000.00	
		251,454.82	5.43%
Engineering and Construction			
*Development and Improvement of Facilities for Public Use	2310-0300	131,919.38	
Certain Renovations to Lyman School Building	2670-8753	30.24	
		131,949.62	2.85%
Equipment			
Purchase of Equipment	2310-0315	71,855.41	1.55%
Secretary, Environmental Affairs			
Office of Secretary (3%)	2000-0100	7,016.00	.15%
Department of Fisheries, Wildlife and Recreational Vehicles			
Commissioner's Office (50%)	2300-0100	47,956.00	1.04%
Department of Environmental Management			
Natural Resource Officers' Salaries and Expenses (30%)	2020-0100	405,898.00	8.77%
Hunter Safety Training (100%)	2020-0300	58,403.00	1.26%
Transfers from Fund			
Group Insurance	1590-1007	216,828.58	4.68%
Retirement Assessment (.2%)	0612-1000	250,715.32	5.42%
Interest on Bonded Debt	0699-2800	72,095.00	1.56%
Maturing Serial Bonds and Notes	0699-2900	165,000.00	3.56%
Total Expenditures		$4,629,949.00	100.00%

*Continuing Appropriation.
**Portions of expenditures 60% or 75% reimbursable by Federal Government.
***Certain Land Acquisitions are 50% reimbursable by Federal Government.

APPROPRIATIONS AND EXPENDITURES
Fiscal Year July 1, 1979 to June 30, 1980

ACCOUNT NO.	TITLE	APPROPRIATIONS	EXPENDITURES & LIABILITIES	TOTAL REVERSION
2310-0200	Administration	616,200.00	615,490.07	709.93
2310-0310**	Acquisition of Upland Areas & Inholding on Existing Areas	327,804.30	76,454.82	251,349.48
2310-0315	Purchase of Equipment	75,000.00	71,855.41	3,144.59
2310-0400*	Wildlife Management	1,087,000.00	1,085,678.38	1,321.62
2310-0600*	Fisheries Management	1,261,180.90	1,249,608.80	11,572.10
		$ 3,367,185.20	$3,099,087.48	$ 268,097.72
		CONTINUING APPROPRIATIONS	EXPENDITURES	BALANCE FORWARD
2310-0300	Development & Improvement Facilities for Public Use	145,759.02	131,919.38	13,839.64
2670-8753	Certain Renovations to Lyman School Building	30.24	30.24	-
2670-9016**	Acquisition of Coastal & Inland Wetlands	209,354.34	175,000.00	34,354.34
2670-9022	Fish Screens, Quabbin	4,020.37	-	4,020.37
		$ 359,163.97	$306,949.62	$ 52,214.35

*Portions of expenditures 60% or 75% reimbursable by Federal Government.
**Certain land acquisitions are 50% reimbursable by Federal Government.

DIVISION OF FISHERIES AND WILDLIFE
RECEIPTS FROM FISHING, HUNTING AND TRAPPING LICENSES
Fiscal Year July 1, 1979 to June 30, 1980

Type of License	*Price	Quantity	Gross Amount	Fees Retained by Clerks	Net Returned to State
Series					
#1 Res. Cit. Fishing	8.25/11.25	110,096	1,131,123.00	22,875.25	1,108,247.75
#2 Res. Cit. Hunting	8.25/11.25	54,093	464,246.25	12,501.00	451,745.25
#3 Res. Cit. Sporting	13.50/16.50	53,833	866,698.50	11,612.50	855,086.00
#4 Res. Cit. Minor Fishing	6.25	8,584	53,650.00	1,808.00	51,842.00
#5 Res. Cit. Alien Fishing	11.25/14.25	908	12,012.00	202.00	11,810.00
#6 Non-Res. Alien Fishing and Non-Res. Cit. Fishing	14.25/17.25	3,734	60,478.50	751.25	59,727.25
#7 Non-Res. Alien and Non-Res. Cit. 7-day Fishing	8.25/11.25	1,914	16,558.50	386.25	16,172.25
#8 Non-Res. Alien and Non-Res. Cit. Small Game Hunting	20.25/23.25	928	19,623.00	213.00	19,410.00
#9 Non-Res. Alien and Non-Res. Cit. CSP 3-day Small Game Hunting	16.25/19.25	47	802.75	11.50	791.25
#10 Res. Cit. Minor Trapping	6.25	530	3,312.50	124.00	3,188.50
#11 Res. Cit. Trapping	11.50/14.50	1,379	17,763.50	327.00	17,436.50
#12 Duplicates	1.00/2.00	3,775	4,420.00	-	4,420.00
#13 Res. Alien Hunting	16.25/19.25	1,346	23,588.50	275.25	23,313.25
#14 Non-Res. Alien and Non-Res. Cit. Big Game Hunting	35.25/38.25	1,079	38,301.75	251.50	38,050.25
#15 Res. Cit. Sporting (Over 70)	FREE	17,729			
#16 Res. Cit. Fishing (Blind, Paraplegic, Mentally Retarded)	FREE	2,406			
#17 Res. Cit. Hunting (Paraplegic)	FREE	104			
#18 Res. Cit. Fishing (Age 65-69)	4.10/5.75	4,602	30,130.85	1,324.50	28,806.35
#19 Res. Cit. Hunting (Age 65-69)	4.10/5.75	612	2,786.40	147.95	2,638.45
#20 Res. Cit. Sporting (Age 65-69)	6.75/8.25	2,693	21,846.75	649.00	21,197.75
#21 Res. Cit. Trapping (Age 65-69)	5.75/7.25	101	675.25	23.50	651.75
		270,493	2,768,018.00	53,483.45	2,714,534.55
#22 Archery Stamps	5.10	10,428	53,182.80	993.40	52,189.40
** Trap Registrations			1,556.50		1,556.50
		280,921	2,822,757.30	54,476.85	2,768,280.45
#23 Waterfowl Stamps	1.25	29,373	36,716.25	6,352.25	30,364.00
		310,294	2,859,473.55	60,829.10	2,798,644.45

*License increase effective January 1, 1980

**Trap Registrations

Initial:	339 @ 2.00	$678.00
Renewal:	583 @ 1.50	874.50
Duplicates:	2 @ 2.00	4.00
		$1,556.50

SPECIAL LICENSES, TAGS AND POSTERS
July 1, 1979 to June 30, 1980

Receipt Acct.	Type of Licenses	Quantity & Unit Price	Amount	Receipt Account Total
3304-61-02-40	Fur Buyers			
	Resident Citizens:	30 @ 15.00	450.00	
	Non-Residents or Aliens:	5 @ 50.00	250.00	700.00
3304-61-03-40	Taxidermists:	103 @ 10.00	1,030.00	
		1 @ 5.00	5.00	1,035.00
3304-61-04-40	Propagators			
	Special Purpose Permits:	135 @ 1.00	135.00	
	Class 1 (Fish)			
	Initial:	32 @ 7.50	240.00	
	Renewal:	137 @ 5.00	685.00	
	Class 3 (Fish)			
	Initial:	17 @ 7.50	127.50	
	Renewal:	75 @ 5.00	375.00	
	Class 4 (Birds & Mammals)			
	Initial:	119 @ 7.50	892.50	
	Renewal:	445 @ 5.00	2,225.00	
	Class 6 (Dealers)			
	Initial:	13 @ 7.50	97.50	
	Renewal:	50 @ 5.00	250.00	
	Additional:	216 @ 1.50	324.00	
	Duplicates:	1 @ 2.00	2.00	
	Class 7 (Individual Bird or mammal)			
	Initial:	7 @ 3.00	21.00	
	Renewal:	190 @ 1.00	190.00	
	Importation Permits			
	Fish:	3 @ 5.00	15.00	
	Birds or Mammals:	26 @ 5.00	130.00	
	Class 9 (Falconry)			
	Apprentice:	8 @ 25.00	200.00	
	General:	12 @ 25.00	300.00	
	Class 10 (Falconry)			
	Raptor Breeding:	3 @ 10.00	30.00	
	Raptor Salvage:	6 @ 1.00	6.00	6,245.50
3304-61-05-40	Take Shiners:	124 @ 5.00	620.00	
		1 @ 3.50	3.50	623.50
3304-61-06-40	Field Trial Licenses:	2 @ 15.00		30.00
3304-61-08-40	Quail to Train Dogs			
	Initial:	8 @ 7.50	60.00	
	Renewal:	12 @ 5.00	60.00	120.00
3304-61-10-40	Commercial Shooting Preserves:	10 @ 50.00		500.00
3304-61-12-40	Mounting Permits:	6 @ 2.00		12.00
3304-61-13-40	Special Field Trial Permits:	35 @ 15.00		525.00
3304-64-01-40	Tags and Posters			
	Game Tags:	7,944 @ .05	397.20	
	Fish Tags:	12,452 @ .02	249.04	
	Posters:	75 @ .05	3.75	649.99
				$10,440.99

COMMONWEALTH OF MASSACHUSETTS

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1982 ANNUAL REPORT

Division of Fisheries & Wildlife

MR
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1982

The Commonwealth of Massachusetts

Division of Fisheries and Wildlife

Leverett Saltonstall Building, Government Center

100 Cambridge Street, Boston 02202

DIRECTOR

His Excellency, Michael S. Dukakis, Governor of the Commonwealth, the Executive Council, the General Court, and the Board of the Division of Fisheries and Wildlife.

Sirs:

I have the honor to submit herewith the One Hundred Seventeenth and One Hundred Eighteenth Annual Reports of the Division of Fisheries and Wildlife, covering the fiscal years from 1 July 1981 to 30 June 1982.

Respectfully submitted,

Richard Cronin

Richard Cronin
Director

Publication No. 13885-50-50-1-85-CR

Approved by Daniel Carter, State Purchasing Agent

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THE BOARD REPORTS

George Darey
Chairman

During 1981-82, the Massachusetts Fisheries and Wildlife Board continued its policy of conducting monthly meetings and public hearings at various locations around the Commonwealth. Five hearings were conducted during this period on a variety of topics ranging from minor wording changes in regulations to sweeping changes in deer season regulations.

Personnel

While there were numerous changes in personnel (see p.46) as in any year, this year had no major changes within the Division staff, although the Board noted with sadness the passing of William Humberstone who had long served the Division at the East Sandwich Game Farm. There was a change in Board composition during the year as former chairman Bradlee Gage announced that he would not seek reappointment. Gage had one of the most distinguished careers in the Board's leadership position taking the agency through some trying times. Gage was replaced on the Board by Laurence Fountain of Springfield. Prior to Gage's resignation, the Board held elections for new officers and selected George Darey of Lenox as Chairman and Nancy Begin of Topsfield as Secretary.

Specific Actions

Specific actions taken during the year involved policy, regulatory and financial operations of the Division. Early in the year, a nongame advisory committee was appointed to assist the Assistant Director of Nongame and Endangered Species with the operation of that program and to provide guidance where appropriate. In this capacity, the Board worked to encourage passage of a proposed nongame checkoff program already successfully in use in many other states. The nongame program is taking shape even without this much needed program and during this year, concluded a working agreement with the Massachusetts Audubon Society to support eagle restoration in the Commonwealth.

In the area of game regulations, the Board considered and accepted changes in the farmer/landowner deer hunting permit system tightening existing eligiblity requirements. Beginning in 1982, farmer permits are available only to a farmer, defined as one who makes 50% of this total annual income from the land in question, or to a member of his immediate family. The land in question must be open to public deer hunting and the permit is valid for that land only. For those who enjoyed the privilege of a farmer's deer permit in past years, but who could not qualify under the new definition, a grandfather option was included which could be exercised at the Director's discretion.

Landowners, defined as those holding at least 300 acres of land open to public deer hunting, were also restricted to one permit per parcel for themselves or any member of their immediate family residing with them. Permits are further limited to one per family.

Deer hunting regulations were modified adding an extra day to the special hunting period for paraplegic sportsmen and permitting bowhunters to take a second deer of either sex.

Fishing regulations - a year-round season was established for the taking of Atlantic salmon in waters where such taking is permissible. To facilitate keeping track of shifting dates when summer trout regulations are in effect, the Board established calendar dates for the transition with summer regulations in effect from April 15 to September 10. Future regulations and regulatory changes should be keyed to these dates to minimize confusion.

The bag limit on bullfrogs, long a matter of contention, was changed from 6 frogs per day to 12 frogs per day with a possession limit of 24 and a provision that greenfrogs be included with bullfrogs in this regulation.

Financial considerations, always in the realm of Board concern, were very much in evidence during the year as new administrative procedures were established by the Legislature which permit changes in fee structure to be made through the office of Administration and Finance ,rather than through the legislature as in the past, eliminating the need for extensive lead time and public hearings. The Board evaluated the new procedure noting its greatly increased efficiency but voted that despite this option and because of the importance of cooperation with supporting groups that they would continue to hold public meetings on any major fee changes. A number of minor fee changes were implemented however. Pursuant to discussions conducted in 1981, the Board eliminated the $1 application fee for the turkey permit. In addition, and because of growing interest on the part of collectors in waterfowl and archery/primitive firearms stamps, it was voted to increase the prices on back issues of the waterfowl stamp.

Issues of Concern

During the course of the year, the Board discussed many issues in depth on which it took no action other than remanding the subjects for further study or for decision at a later date. Among these were:

Policy - the Board continued to review a policy document drafted by a staff committee intended to replace the previous policy issued in 1958.

Bear Season - the current bear season presents a number of problems related to timing and method of harvest. The present season is too late to assist farmers in reducing crop depradation and is occasionally so late that bears have already denned. As it is the last New England bear season, there is a potential that the season will attract too many bear hunters. The Division is also concerned about the use of electronic devices, which could adversely affect the season. Proposals to meet these problems were considered and input from a public hearing was held for decision next year.

Deer Season - consideration of changes in existing deer hunting regulations stemmed from the fact that the herd is close to carrying capacity in some portions of the state and it is the desire of the Division to fine tune the management system in such a way that the herd can be controlled at an acceptable level. This too was held for decision at a future date.

Dove Season - The possibility of a dove season was considered and voted down.

Finances - Finances have always been an issue of concern to the Board and never more so than during this year. With over a half million dollars cut from the budget, it appeared that it would be necessary to curtail programs and production, reduce staff and close one district office, one game farm and one fish hatchery. Planning was well underway for this unfortunate move when a supplementary budget was passed by the Legislature and signed by the Governor. Special thanks from the Board to Governor Edward J. King for his faith and support as shown by his submitting a special bill for this agency.

PLANNING

Kristine L. Corey
Junior Planner

Fiscal year '82 saw the retirement of Senior Land Use Planner, Paul Mugford, following the transfer of Junior Planner, John Jonasch to another agency. Not only did the planning staff sustain the loss of their expertise, but financial constraints have prevented the filling of their positions as well. Despite this severe reduction in staff, the comprehensive planning effort has continued to receive support and make progress.

In the process of re-evaluating the project, the administration designated a Planning Committee to oversee the project and become more actively involved in the completion of the agency's comprehensive plan. This new committee consists of the Director, the Deputy Director of Field Operations, the Assistant Directors of Wildlife, Fisheries, and Nongame and Endangered Species, the Federal Aid Administrator, the Chief of Information and Education and the Planner. The contributions of this group have proved extremely valuable.

Perhaps the most significant accomplishment in planning this year was the completion of the first draft strategic plan, consisting of an introduction, overview and management plans for selected species. This document will provide long-range direction for Division activities and will be the foundation for developing operational plans.

Other planning activities included the gathering of small game data via a telephone survey, the completion of an inventory of named streams within the Commonwealth, and the development of training aids to be used in communicating planning functions and techniques to agency personnel.

FISHERIES

Peter Oatis
Assistant Director, Fisheries

Anadromous Fish Management

Merrimack River

The hydro-electric facility at the Essex Dam began operations in September, 1981. Construction and design problems however prevented the successful operation of the fishway during the spring run of salmon and shad. Despite the fact that fish were unable to pass the dam, the spring fishery appeared to prosper. An estimated twenty-five salmon were taken along with hundreds of shad. Many salmon and shad were still in the pool area below the powerhouse as late as mid-July.

Fewer smolts were released (67,000) than in the spring of 1981, (100,000), but the additional release of 200,000+ parr will contribute significantly to the run of salmon during the next few years. As in the past, adult shad were transferred from the lower Connecticut River to potential spawning sites upstream. The young shad produced via these interbasin transfers should greatly hasten the speed with which shad re-establish themselves once suitable access is secured at upriver dams.

It now looks as though fish passage at the Pawtucket Dam in Lowell may become a reality by the spring of 1985. If such is the case, anadromous species will be able to travel at least to Manchester, New Hampshire, by the spring of 1985.

Connecticut River

As expected, the 1982 salmon run reflected the low availability and reduced stocking of smolts during the spring of 1980. A total of 67 adults were captured, (11 at Holyoke), and used for development of brood stock. The release of 225,000 high quality smolts throughout the basin in 1982 should greatly enhance the expected adult returns of 1984. Approximately 41,000 of these smolts were reared at the Reed Hatchery in Palmer.

A great deal of time was spent by the basin states and federal agencies in updating and developing future Atlantic salmon operational plans. The Connecticut River Salmon Compact was submitted to Congress for ratification. When in effect, the Compact will bestow salmon management authority on its Commissioners throughout the entire mainstream of the river.

The population of shad appears to be stable with about 295,000 passing Holyoke; while blueback herring populations reflect on expanding population as 587,000 adult bluebacks passed through Holyoke.

Over 8,000 adult shad were shipped to augment restoration efforts of that species in Rhode Island, Pennsylvania and Eastern Massachusetts (Charles and Taunton Rivers). Additionally, over 3,600 shad were shipped above Vernon, Vermont to augment restoration and population enhancement in upriver areas. A creel survey of the shad fishery in Holyoke indicates that between 10,500-11,000 anglers annually fish for and catch over 10,000 shad.

Stream Management

To complete data required by comprehensive planning efforts and to provide a sound aquatic classification system, fishery crews stationed at the five District Headquarters sampled a total of 151 stations within 115 priority-one stocked trout streams throughout the Commonwealth.

Stream survey data is used as input to developing a data base for a management system which will facilitate analysis, synthesis and subsequent stream fishery resource classification.

Project Leader, David B. Halliwell, as a Ph.D. candidate at the University of Massachusetts, Department of Forestry and Wildlife, submitted an approved dissertation prospectus entitled: "A Classification of Streams in Massachusetts". A major objective of this research project is to develop a classification of habitats in Massachusetts streams based on their relative natural productivity and capability to sustain various types of fish populations as well as sport fishing opportunity; special emphasis is directed at native/wild trout production in Massachusetts. It is expected that these efforts will greatly enhance the management decisions that the Division makes with respect to the protection and stocking of trout and enhancement of the Commonwealth's streams and rivers.

Sea Run Brown Trout

During September and October of 1981, fisheries crews collected 56 adult sea-run brown trout that produced 70,000 fertile eggs for future fisheries development. These young fish will be liberated in coastal streams during March and April of 1983. The quality of young sea-run brown trout reflects the recent improvements installed at the Sullivan section of the Sandwich Hatchery complex.

The Quashnet River restoration is progressing on schedule. Personnel from the Sandwich Game Farm spent a great deal of the winter clearing an additional 1,500 feet of stream bank. Their efforts were followed by cleaning of an additional 300 feet of stream bank and installation of five overhead covers by volunteers from Trout Unlimited.

Similiar stream bank and potential sea-run brown trout fishery development actions were initiated on the Mattapoisett River with the assistance of the Mattapoisett Fin, Fur and Feather Club.

During the spring of 1982, the Fish and Wildlife Board declared that the fly fishing only area of the Swift River, Belchertown, would become a catch and release fishery (flies only) on a year round basis beginning January 1, 1983. They also set aside the downstream stretch of the Swift River bounded by the Route 9 bridge (to the north) and Cady Lane (in the south) to catch and release fishing, artificial lures only, during the months of July, August and September. Documentation as to the degree of success of these new regulations will be recorded during the summer of 1983.

Lake Management

Information provided by numerous biological surveys of lake and ponds is aiding in the evaluation of the newly increased length limits for black bass and chain pickerel. Additional water chemistry analysis indicates that a great many ponds in the southeast and north central portion of the state are either threatened or endangered by increased acid input primarily emanating from acid rain and snowfalls. To counteract this input, Division personnel have limed twelve ponds classified as critical at the rate of one-half ton lime per acre; total 695 acres. In addition, the agency is cooperating with numerous federal, state and private agencies and universities to assess the magnitude and effects of acid rian.

Northern Pike

Numerous pike stemming from the last stocking of available fish from Minnesota in 1979, have shown up in the fishery as 12 to 20 pounders. There are also unconfirmed reports that many small pike have been caught and released in the Brimfield Reservoir complex. If this is true, future efforts may focus on capturing some adults that could be used to produce young for stocking other lakes and reservoirs where reproducing populations are desired.

Tiger Muskies

Approximately 50,000 tiger muskie fry received from the state of Pennsylvania were reared to produce 22,000 fingerlings at the Reed Hatchery in Palmer. These fish were released into selected ponds across the state in accordance with management recommendations stemming from the survey and inventory of lakes and ponds.

The first legal sized tiger muskie was caught in Lake Cochituate during the summer of 1982, while numerous reports of such legal fish being caught were noted.

Bass

Division staff finished the job of stocking adult smallmouth bass into formerly reclaimed trout ponds and successfully reared young walleye for Lake Assawompsett in an attempt to establish a source of state brood stock for future development purposes.

Alewives

Landlocked alewives were transferred from Lake Congamond, Southwick to Little Alum Pond, South Pond, Brookfield and Lake Chauncy, Westboro. It is hoped that new populations will become established and will enhance the growth of native game species. Recent investigations indicate that the 1981 release of alewives in Lake Singletary, Millbury were successful in becoming established.

Quabbin

The Quabbin continues to provide excellent lake trout, smallmouth bass and bullhead fishing for the estimated 56,400 anglers that fished the reservoir last year. Although the smelt population appears to be down, condition factors of all game fish are very good. A small isopod is apparently providing an excellent source of food for lake trout.

For the first time since the mid-1970's, landlocked salmon, the result of a release in 1980, are returning in good numbers despite the increase in the minimal legal harvest length from 15 to 18 inches. Within the next few years, Quabbin is expected to become self-sufficient with respect to securing sufficient eggs for brood stock production.

Technical Assistance

A great deal of time and effort was spent investigating and commenting upon potential impacts of hydro-power development at numerous dams across the state. Additional time was spent collecting fish samples for numerous toxic waste investigations such as the creosoteproblem at Hocomoco Pond, Westboro and the concern about mercury in the Concord River.

There were numerous fish kills of which only one was noteworthy. That problem killed thousands of carp in the Merrimack River through infectious dropsy. Initial ground work was also prepared to obtain board permission to import hybrid amur for the purpose of controlling nuisance aquatic vegetation in many lakes and ponds across the state.

HATCHERIES

David Fredenburgh
Chief Fish Culturist

During fiscal year 1982, the hatcheries produced 1,163,000 fish weighing 437,625 lbs. Of that total number, 940,600 were catchable size trout.

The East Sandwich Coho Sea-Run Brown Trout Hatchery was completed and dedicated on October of 1981 to the memory of Arthur Sullivan, long-time newsman and outdoor writer. The dedication was well attended by state and federal officials, sportsmen's club members, and local citizens. A three man staff will eventually be assigned there on a permanent basis.

The Roger Reed Salmon Hatchery (Palmer) had a successful year with the production of 41,400 sea-run salmon. A total of 154 adult salmon were held at the hatchery. One hundred and nine of these fish were spawned yielding 500,000 eggs. The hatchery also housed tiger muskies and during this first year of production, 10,050 fish were raised and stocked.

Due to budgetary problems, it was decided to deed the Podick Springs section of the Sunderland Hatchery to the Federal Fish and Wildlife Service, which plans to use it as an Atlantic Salmon holding facility. Because of the reduced production at Sunderland, staffing will be reduced by one person.

Normal maintenance projects were carried out at all the other hatcheries with no major construction activity.

PRODUCTION FIGURES 1981-1982

	2-4"	6"	6-9"	9-12"	12+	Weight	Tot. Fish
McLaughlin							
Rainbow	-	-	-	235,572	16,300	141,873	251,872
Brook	-	-	131,335	900	60	43,068	132,295
Brown	-	-	130,250	-	-	34,694	130,250
Totals	-	-	261,585	236,472	16,360	219,635	514,417
Montague							
Rainbow	-	-	-	76,250	-	72,157	76,250
Brook	-	-	-	-	-	-	-
Brown	-	-	-	-	-	-	-
Totals	-	-	-	76,250	-	72,157	76,250
Sunderland							
Rainbow	40,000	-	20,000	29,975	-	22,280	89,975
Brook	42,500	-	21,600	38,650	-	29,899	102,750
Brown	20,000	-	-	29,000	-	22,973	49,000
Totals	102,500	-	41,600	97,625	-	75,152	241,725
Palmer							
Rainbow	30,000	-	-	-	-	459	30,000
Brook	-	-	-	1,467	480	1,944	1,947
Brown	-	-	-	365	785	1,740	1,150
Atl. Sal.	-	-	41,415	-	-	3,425	41,415
Kokanee Sal.	20,250	-	-	-	-	455	20,250
Tiger Muskie	-	-	10,050	-	-	557	10,050
Totals	50,250	-	51,465	1,832	1,265	8,580	104,812
Sandwich							
Rainbow	-	-	30,825	63,800	-	39,723	94,625
Brook	-	-	20,200	11,775	-	10,399	31,975
Brown	-	-	20,145	9,500	-	8,126	29,645
Coho	-	70,147	-	-	-	3,303	70,147
Totals	-	70,147	71,170	85,075	-	61,551	226,392

WILDLIFE

Chester M. McCord
Assistant Director, Wildlife

The Wildlife Research Section consists of one chief, three game biologists, two assistant game biologists, one restoration project field agent, and one conservation helper. This staff is responsible for research and management of approximately 75 species of mammals, birds, reptiles, and amphibians which are traditionally hunted, trapped or otherwise taken for food, animal products, or sport. Additionally, the section is responsible for administering the Division's falconry program for coordinating development of the Division's wildlife management areas, and for recommending to and advising the senior staff and Fisheries and Wildlife Board on matters of administration regulation, and policy relative to the Commonwealth's wildlife resources. The section oversees three Federal Aids in Wildlife Restoration Projects (W-9-1, W-35-R, and W-42-R) comprising about 35 research jobs in addition to about five other jobs conducted by the Massachusetts Cooperative Wildlife Research Unit and supervised by the Division. Section biologists also coordinate with the Realty, Planning and Nongame Sections when particular expertise on wildlife matters is needed. Summaries of current studies underway follow.

Waterfowl

Preseason Banding

A total of 735 birds were banded during the 1981 preseason banding segment; 285 wood ducks; 293 mallards; 51 black ducks; 12 mallard x black hybrids; 56 greenwinged teal; 32 bluewinged teal; 1 American wigeon, 1 hooded merganser; 1 American coot and 3 pied-billed grebes. A cooperator banded an additional 320 least sandpipers; 181 semipalmated sandpipers; 16 pectoral; 11 spotted; 7 solitary and 1 western sandpiper; 12 semipalmated plover; 29 killdeer; 13 lesser yellowlegs and 1 snipe.

Waterfowl Inventory Flight

A total 158,453 waterfowl were counted during the January winter inventory up 16% from 1981 and 18% over the previous 10 year average. Mallards, mergansers, goldeneyes, sea ducks and Canada geese numbers were all up compared to 1981. Bufflehead and scaup were basically unchanged. Weather conditions prior to flight were mild and most coastal areas were ice free.

Winter Banding Program

The winter of 1981-82 was near normal with a severe cold spell that began the second week in January and continued into February. While icing was extensive during this period, there was no evidence that black ducks were unduly stressed. Division personnel and their cooperators banded a total of 627 male and 494 female black ducks. These, along with 267 male and 139 female black ducks banded by the personnel of the Parker River National Wildlife Refuge, exceeded the state's quota of 400 male and 600 females required by the U. S. Fish and Wildlife Service. Division personnel also banded 183 mallard x black hybrids, 19 mallards, and 26 pintails.

Wood Duck Population Study

A bulletin, Wood Duck Research in Massachusetts, 1970-1980, was printed by the Assabet Valley Regional Vocational Technical High School in May 1982. The bulletin, number 19 in the Massachusetts series, summarizes nesting histories, disease and pesticide effects on wood ducks, yearling productivity, the effects of dump nesting, the effects of starling competition and examines the migration pattern and harvest of Massachusetts' reared birds. This 67 page bulletin is available through the Division's Westboro office for $2.00.

Wood Duck Nest Box Study

1981-82 was the final segment of a three year study to compare District winter box checks with actual spring-summer production. On a statewide basis, the three year results indicate the correlation between winter and summer box checks was very close; under 1% difference. However, accuracy was lower than this figure implies. Nests were missed for a variety of reasons during winter box checks, but other nests were reported in boxes that had no duck usage the previous summer. Reporting of "extra" nests was particularly prevalent in the North Central and Concord Regions where District personnel reported 13% more nests than were found during summer checks. In the rest of the state, District personnel reported 7.6% fewer nests during winter checks than were found during summer checks. Steps will be taken to address the over-reporting rate in problem areas. This study has concluded that winter box checks require a 5-10% revision upwards to determine actual wood duck population levels.

Park Waterfowl Investigations

A manuscript, "Movement and Survival Rates of Park Mallards" was published in the 1982 fall issue of The Journal of Field Ornithology and a second manuscript on the effects of hunting on park mallard populations was submitted to the Wildlife Society Bulletin.

Experimental Waterfowl Season Appraisal

In 1981-82, Massachusetts experimented with a zoned waterfowl season with a split in each zone. This season found widespread acceptance; 75% of 200 active waterfowlers surveyed in telephone interviews approved of the season dates, while 55% preferred the zone system to the former two segment statewide season and 34% had no opinion. Forty-one percent preferred the zoned system to the alternative three segment seasons, while 34% again had no opinion. Harvest under the first year of zoning was lower than in previous years.

Deer

The 1981 statewide deer harvest for all seasons combined was 5,011 deer, which is an increase of 1,517 over the 1980 harvest of 3,494. Seventy-five (75) percent of the deer harvest was reported in the four western counties of Berkshire, Franklin, Hampshire and Hampden. Worcester County contributed 12 percent (608 deer) of the total harvest and Barnstable County, three percent (148). The islands of Dukes and Nantucket Counties contributed two percent (79 deer) and three percent (147 deer) of the total. Management zones I and II combined contributed four percent (214 deer) to the overall total.

A total of 4,321 deer were taken during the December shotgun-only season, including 2,789 antlered males and 1,532 antlerless deer. Archers took 418 deer (263 bucks, 155 does) and primitive firearm hunters bagged 264 (107 bucks, 157 does). Paraplegic sportsmen harvested eight (5 bucks, 3 does) during their special season.

Successful archers were permitted, for the first time ever, to obtain a special permit to take a second deer during either the shotgun or primitive firearms season. This bonus permit resulted in the taking of 44 "second" deer (30 bucks, 14 does).

A total of 45,727 applications were received for an allotment of 6,300 antlerless deer permits for the 10 deer management zones and 480 additional farmer-landowner permits were issued.

Natural Resource Officers reported a total of 625 non-hunting deer mortalities during calendar year 1981. Road kills (439, 70%) were the most prevalent source of mortality, followed by illegal kill (81, 13%), dogs (36, 6%) and miscellaneous causes (64, 11%).

Beaver

During the 1981-82 zoned beaver season, a total of 594 beaver were taken by 96 trappers in 86 towns. This take represented a decrease of 312

(34%) from the 1980-81 take. The decrease in take was most pronounced in Berkshire, Hampshire and Worcester Counties, with the take in Essex and Hampden Counties increasing slightly. The east and west zones reflected nearly identical decreases. Changes in the monthly distribution of the take were most evident in eastern Massachusetts.

Otter and Fisher

The 1981-82 otter season extended from December 15 to February 28 west of the Connecticut River and November 23 to February 28 east of the river. The 1981 fisher season extended through the month of November. During the season, 54 trappers took a total of 90 otter in 56 towns for a mean take of 1.7 otter per successful trapper. This compares with a take of 143 and a mean of 1.7 in 1980-81.

The fisher take remained stable at 116 (115 in 1980), with 54 trappers taking a mean of 2.1 fisher each in 46 towns. Berkshire (26) and Worcester (23) Counties yielded the most otter and Worcester (73) and Essex (17) the most fisher. A total of 35 otter and 114 fisher carcasses were received from cooperating trappers. The mean age of otter taken in 1981-82 was 1.88 years and of fisher 1.41. This compares with 3.06 for otter and 2.20 for fisher in 1980-81. All (2,100%) of the otter aged 2.5 and above and 22 (68.2%) of the fisher aged 1.5 and above during 1981-82 had been bred. This compares with figures of 38.8 percent for otter and 51.1 percent for fisher in 1980-81. Average corpora lutea counts were 2.0 and 2.3 for otter and fisher respectively, in 1980-81, and 3.0 and 2.5 in 1981-82.

Coyote

Massachusetts' first coyote hunting season was initiated in the fall of 1981. A total of 18 coyotes were taken by 14 hunters in five counties and 16 towns during the 1981-82 hunting season. Two-thirds of the kill was in November, with 10 (56%) animals taken by hunters seeking coyote. Eighty percent of those taken were young-of-the year.

Bobcat

The total harvest of 34 cats was comparable to the 36 taken in 1980-81. Hunting with dogs accounted for 16 kills, trapping 13, four road kills and one incidental kill. The harvest was very similiar to previous years in all categories.

Mourning Dove

The total number of calling doves on three long-term randomized routes increased 14 percent from 39 to 44 doves during 1981-82. Counts on all 17 comparable routes decreased 4 percent (183 to 175) from 1981 to 1982.

Bobwhite Quail

The 1981 weighted call indices for Barnstable, Bristol and Plymouth Counties and for the statewide total showed no significant difference from 1979 or from a five-year (1971-79) mean index. Comparisons between comparable routes only for 1981 and the five-year mean disclosed a signficant change in Barnstable County call indices.

Turkey

Massachusetts' third spring gobbler season was held during a two-week period in May 1982. The hunting zone was revised from previous years to include all or part of three counties. A total of 3,000 permits were allotted, with 198 birds taken. The participation rate was 89.3% (2,679) and the success rate 7.4 percent. Berkshire County yielded 176 turkeys, Franklin County 18, and Hampden County 4. Adult turkeys weighed 14.8 - 20.0 pounds (gutted); immatures 10.1 - 15.0 pounds (gutted). Three bearded hens were taken. Adult males comprised 111 (56.1%) of the total kill.

Seventy-seven turkeys (38M, 39F) were taken during winter trapping efforts, with a mean capture rate of 0.55 turkeys/trap-hour and a mean success rate of 73 percent. Twenty-two birds (7M, 15F) were released on Mt. Toby State Forest, 24 (8M, 16F) on the Holyoke Range, 11 (4M, 7F) in the D. A. R. State Forest, 8 males in West Brookfield State Forest, and 7 males on the Millers River Wildlife Management Area. Four toms were released at the capture site in Tyringham and one hen was a capture mortality.

Black Bear

A total of 988 bear hunting permit applications were received during 1981. Two male bears were taken by hunters, including one each in Franklin and Hampden counties. Two road kills, one nuisance kill, and one illegal kill were also recorded. New reports of 55 observations totalling 73 bears were received from 37 towns. Fourteen nuisance complaints were received, including beehive and livestock depredations, residential complaints, encounters, and miscellaneous problems.

Wildlife Species Files

The wildlife species filing system begun in 1979 was expanded to cover 137 species and updated through 1981-82. An interactive computer program on wildlife distribution was developed. Collation of the data base for this program is in progress.

Falconry

During fiscal year 1982, 24 people were sent information on falconry. 12 people applied for and took the falconry exam, 9 of these people passed the exam, had their mews inspected, and went on to become falconers. As of July 1, 1982, there were 32 licensed falconers, in all categories combined in Massachusetts.

Woodcock

Division biologists prepared assessment on the effects of a heavy snowfall in early April, 1982 on the woodcock breeding population. Because woodcock breeding populations were down 37% in Massachusetts, the Fisheries and Wildlife Board reduced the bag limit on woodcock from five to two in the fall of 1982.

Wildlife Development

The W-9-D Project deals mainly with management of the Division's Wildlife Management Areas, and also encompasses the construction and maintenance of nesting structures throughout the state. Management of the wildlife areas includes habitat management, development and maintenance of public access facilities, delineating areas through posting of signs and boundary markers.

Listed below are jobs completed during this period.

Job No.	Name	Description
1	Buildings	Maintenance of 16 buildings on 10 areas.
2	Dams	Maintenance of 1 dam on the Swift River Wildlife Management Area.
4	Bridges	Construction of 1 foot bridge on the Bolton Flats Wildlife Management Area.
		Maintenance of 2 vehicular bridges on the Martin Burns and Bill Forward Wildlife Management Areas.
5	Roads & Trails	Construction of 1.2 miles of trails on the Swift River and Crane Wildlife Management Areas.
7	Fences	Maintenance of 0.7 miles of fences on two areas.
8	Parking Lots & Waterfowl Blinds	Constructed one parking lot on the Popple Camp Wildlife Management Area.
		Maintained 55 lots on 15 areas.
		Maintained 15 blinds on 2 areas.
11	Signs & Boundary Markers	Erected and maintained 1,279 signs on 27 areas.
12	Tree & Shrub Planting	Planted 1,525 shrubs and 200 trees on 3 areas.
13	Herbaceous Seedings	Planted and/or maintained by liming and fertilizing 256.5 acres of fields on 9 areas.
15	Vegetation Control	Controlled unwanted brush encroaching on fields and cleared areas; 263.5 acres controlled by brushcutting, 32.5 acres by herbiciding.
21	Timber Management	Selectively cut 11 acres of forest on 3 areas.

22	Nesting Structures	Constructed and maintained 1,220 wood duck nesting boxes statewide. Constructed 6 osprey nesting platforms in the Southeast Wildlife District.
30	Managed Public Hunts	Controlled hunting was administered for 3 areas.
31	Custodial Functions	Management Areas were regularly inspected to review work and assess effects of management and public use.
34	Gates	Constructed 13 gates on 3 areas. Maintained 10 gates on 4 areas.

GAME FARMS

E. Michael Pollack
Chief Game Biologist

Fiscal Year 1982 was a difficult time for the Propagation Section. From March 15 through April 20, we experienced below freezing temperatures at Wilbraham and Ayer Game Farms. Average temperatures for this period at Ayer was 24°F. On April 9-10, a blizzard arrived. Results were disastrous in spite of the attempts of game farm personnel to continuously "pick-up" eggs before they froze. During this period, over 50,000 pheasant eggs were discarded. Egg production of 1,800 dropped to 400. In addition, several hundred hens were killed in the blizzard. The exact number of frozen eggs could not be immediately determined. However, they did appear during the incubating and hatching process.

During normal years, the Division's incubating and hatching schedule is completed by mid-June in six hatches. However, this year, due to inclement weather conditions noted above, hatching continued through late July. Late hatches always bring problems. Hatchability and viability are greatly lowered. Egg production is greatly reduced when brood stock start to molt.

In addition, at this time, the farms experienced difficulty with a poor lot of game bird feed. The chicks refused to eat and many starved to death. However, our troubles did not cease there. For the first time in several decades, we were hit with an unknown virus which caused a high chick mortality. The University of Massachusetts poultry specialist worked extensively on the problem, but without success. Efforts were made to offset this by importing chicks from Pennsylvania. These too were affected by the virus, resulting in high losses.

Game farm personnel worked hard and for long hours under the worst conditions in order to produce the more than 50,000 birds needed for the fall stocking.

Game Farm Production

Fiscal Year 1982

Pheasant

Game Farm	SR	A	B	C	PG	Misc*	Totals**
Sandwich	170	-	1,600	2,860	8,056	300	7,564
Wilbraham	1,755	-	3,456	7,400	7,564	350	20,175
Ayer	2,020	60	2,392	5,868	12,423	300	22,763
Totals	3,945	60	7,448	16,128	28,043	950	50,502

*Miscellaneous - Cocks and hens for field trials, displays, youth hunt, etc. approximate number. In addition, approximately 3,500 brood stock were liberated.

**Total numbers are for cock birds only.

Quail

A total of approximately 4,675 quail produced at the Sandwich State Game Farm were released on the wildlife management areas in the Southeast Wildlife District. In addition, approximately 600 quail were distributed for field trial purposes.

White Hare

A total of 800 white hare were purchased from a dealer in New Brunswick, Canada for release in suitable covers.

NON-GAME AND ENDANGERED SPECIES

Bradford G. Blodget
Assistant Director
Nongame and Endangered Species

The Nongame and Endangered Species Program continued operations in fiscal year 1982 despite severe funding shortages. Revenues were augmented by the establishment of a special Bald Eagle Trust set up to receive a $10,000 grant from the Massachusetts Audubon Society and the initiation of Federal Aid for the osprey and purple martin projects. These and other highlights of the year's operations follow.

Nongame Advisory Committee

A seven-member committee was named by the Director in September 1981 to assist and advise the Assistant Director on all matters pertaining to the Nongame and Endangered Species Program. This committee will eventually play an important oversight role in the administration of the program if the voluntary income tax check-off provision becomes law. Members were selected to represent a broad range of views and expertise from all areas of the Commonwealth. Richard T. Kleber, the Fisheries and Wildlife Board member especially interested in nongame and endangered species was named Chairman to provide a direct tie-to-the-Board and to assure that the Committee's views are transmitted to the Board. The other six members include: Kathleen S. Anderson, Director of Manomet Bird Observation, Middleboro; Robert A. Clark, Photographer and Naturalist, Petersham; Marilyn Flor, Audubon Teacher, Lenox; Karsten Hartel, Curator of Fish, Museum of Comparative Zoology, Cambridge; Gwilym Jones, Professor of Mammology at Northeastern University, Framingham; and Rudolph Stone, Naturalist, Holyoke. The Committee has established a pattern of meeting monthly with the Assistant Director to discuss problems and offer suggestions.

Nongame Income Tax Check-off Legislation

Legislation to establish a voluntary check-off system for nongame wildlife passed the legislature, but was vetoed by Governor King in the closing hours of the session. The veto apparently came in response to concerns in the Revenue Department that the check-off might get out of hand and result in an avalanche of requests for different causes. So far, the experiences of the 20 other states that have check-offs have not borne out this fear.

The Division continues to feel that the check-off, refiled in the 1982 session, is the fairest and most desirable funding scheme for nongame programs. The Division points out that wildlife warrants the special provision of a check-off because of the role of government as a public trustee in the stewardship of wildlife resources. This principle has been an integral part of U. S. Supreme Court decisions and of American wildlife laws since the late 19th century. Court actions have established that wildlife is the collective property of all the citizens -- not private property of individuals or groups. Because wildlife is held by the Division as a public trust, it is most appropriate that a public document -- the income tax form -- be utilized to solicit funds to care for the public's collective property. Furthermore, wildlife needs have not historically been funded by General Fund and in the legislature wildlife needs often experience trouble competing with social issues for limited public funds.

Bald Eagle Trust

A special trust was established under provisions of Section 7, Chapter 131, M.G.L. in the Office of the State Treasurer for the express purpose of receiving a grant of $10,000 from the Massachusetts Audubon Society to be used only for the hacking of bald eagles. These funds were used mainly for materials to build a hack tower, associated equipment, and to pay a graduate student's stipend to safeguard the young birds.

Endangered Species Cooperative Agreement

The Division's agreement with the U. S. Fish and Wildlife Service which allows Federal reimbursement of approved endangered species activities was renewed October 1, 1981 .

Bald Eagle Hacking Project

Two eaglets were obtained from the State of Michigan and flown to the hack site on Prescott Peninsula within Quabbin Reservation on June 10. Both birds successfully fledged July 29, 1982. Each was banded, wing tagged and equipped with a tail-mounted radio transmitter. Activities are underway to increase the number of eaglets to four to six in 1983.

Bald Eagle Winter Survey

Statewide survey and inventory activities carried out January 8, 1982 revealed the presence of 10 bald eagles and three golden eagles.

Plymouth Red-Bellied Turtle

Basic life history research work on this endemic continued during fiscal year 1982. A decision was made to focus more attention on reconnaissance activities to attempt to locate all populations. Semi-annual progress reports on the status of this work are on file with the Division.

Nongame Wildlife for Special Consideration in Massachusetts

Work was substantially completed on a second edition of this listing. Sixteen "Endangered", three "Threatened", 23 "State Rare", 39 "State Local", and 15 "Peripheral" species are listed with a brief account of their range in the Commonwealth. The new list contains a complete, revised introduction and a new section detailing the Division procedure that will guide further amendments of the document. At the same time, staff of the Natural Heritage Program (DEM) completed work on a companion document, "Native Plants for Special Consideration in Massachusetts". Both lists will be issued by the Division as Fauna of Massachusetts Series Numbers 5 and 6 early in fiscal year 1983.

Other Nongame Species Projects

Great Blue Heron Inventory - In 1982, Division biologists located nine (9) active great blue heron rookeries in the Commonwealth. Total active nests numbered 125 and there were 240 plus young fledged. Average production per nest was 2.2 young.

Purple Martin - Division personnel at the Ayer Game Farm built 24 purple martin houses. An additional two were constructed at the Assabet Valley Regional Vocational Technical High School. By the end of fiscal year 1982, 16 units had been installed at various places around the state. Cooperating agencies in the installation of houses included the Allen Bird Club, Felix Neck Trust, Holyoke Wildlife Club, Massachusetts Audubon Society, Northeast Utilities at Northfield Mountain Recreational Area, Trustees of Reservations and the Worcester Science Center. A substantial emphasis in the Purple Martin restoration effort is aimed at encouraging nesting box construction and proper installation by the private sector. At the end of June 30, 435 inquiries for information have been handled and plans mailed.

Osprey - During fiscal year 1982, the Division continued the cooperative osprey restoration project with Commonwealth Electric Company. Poles were installed at Washburn Pond in Mashpee, the old fish rearing station in Rochester and at Talbot's Point in Sandwich. In addition, the Division cooperated with Dr. Edward Shannon in the placement of three utility poles in the Hummock Pond area of Nantucket and furnished certain hardware to the Gilbert Fernandezes for additional poles and the Division provided technical assistance in their placement. The Fernandezes have been volunteer wardens for the Westport River Osprey Group for many years. During the 1982 nesting season, three were 51 active nests. Thirty-five (35) nests produced young, for a total of 67 fledged (1.91 young/successful nests). Ospreys nested for the first time at Nantucket in 1982. However, none of the Division installations were used by ospreys in 1982. It is anticipated that as the population continues to increase, at least some additional poles will be colonized over the next five years and will hopefully constitute an expansion of the species' currently very limited range in the Commonwealth.

Tern Management - The Division's involvement in management was low key during the 1982 nesting season due to lack of nongame funding and personnel. As in prior years, the Division coordinated a meeting of tern wardens and other cooperating individuals and organizations for the purpose of assessing the status of the tern populations.

Normal settlement and colony establishment by least tern was severely belated in 1982 by protracted rains and recurrent storms, a situation that made census taking of least terns even more difficult then usual. Nevertheless, after all adjustments, the 1,812 pairs found were comparable to the 1,856 pairs in 1981 and suggested little fundamental change of the base population. The common tern nested at 22 stations in 1982 (compared with 18 in 1981) and total pairs rose to 7,577. Increases in various colonies seemed to more than offset a 25 percent drop in the Monomy colony.

Roseate terns numbered 1,986 pairs in the 1982 nesting season, continuing a stable population at Bird Island in Marion. Unfortunately, the Arctic Tern population declined in 1982, dropping to 23 pairs distributed among seven colonies. This continues a steady decline from the 53 pairs in 1978. The reasons for this decline are not known.

Salamander Survey - Division personnel participated in the statewide "Salamander Watch" intended to develop more definitive information on the fossorial mole or ambystomid salamanders. Division personnel, concentrating in the Worcester County area, recorded a new site for the mabled salamander, two new sites for the blue-spotted salamander and at least a dozen sites for the spotted salamander. On a statewide basis, sightings were recorded from 52 towns in 11 counties. All data will be stored on the Massachusetts Natural Heritage Program data banks.

NORTHEAST DISTRICT

Walter Hoyt
District Manager

The Northeast District performed its traditional functions of stocking fish, pheasants and varying hare; of managing seven wildlife management areas and five sanctuaries; of cooperating with other state, local and federal agencies; of providing exhibits for major wildlife oriented events; and, of controlling nuisance wildlife. Research projects were conducted in cooperation with or under supervision of Westboro biologists.

Wildlife

District personnel stocked 6,160 pheasants and 140 varying hare. In addition, we trapped and moved 15 beaver; provided advice for many nuisance problems received by phone and picked up about 20 sick, injured or trapped animals.

Cooperative farmer programs were continued on the Martin Burns and William Forward Wildlife Management Areas.

We cooperated with research personnel on such research projects as woodcock census, dove census, waterfowl inventory, assessment of wood duck box use, a mast survey and operation of deer checking stations.

Activities on Wildlife Management Areas included development and maintenance of roads, trails, fences, buildings, clearings and signs; water level control on the Delaney Wildlife Management Area; wildlife planting and seedings; and fertilizing and liming of fields. Controlled hunts were continued on the Martin Burns Wildlife Management Area and the Delaney Wildlife Management Area. Land purchased by the Corps of Engineers as part of the Charles River Natural Valley Storage Project were identified and posted. A cooperative wildlife management plan was initiated with the US Army Corps of Engineers.

Three hundred and twenty-five permits were issued to use the target range at the Martin Burns Wildlife Management Area. This range was moved to a new location in 1980. The new location has worked to the benefit of all.

Five sanctuaries were posted and bounds marked as required.

Fisheries

Approximately 225,000 trout were stocked in suitable ponds and streams during the spring. An additional release of approximately 6,000 catchable size trout and 3,000 fingerlings was made in the fall. Considerable time and effort was devoted to the biological survey of streams and ponds in cooperation with the fisheries research section.

Six boat access ramps were maintained as required.

The bass rearing system at the Harold Parker State Forest was not operated this year.

Miscellaneous

The District and Essex County League of Sportsmen co-sponsored the Youth Upland Training Program. Seventeen youths participated in the hunt and twenty-four took the training session.

Exhibits and manpower were provided for National Hunting and Fishing Day at the Concord Rod and Gun Club, Lowell Flytyers Annual Show in Dracut, and the Topsfield Fair. The district cooperated with other Division personnel in the New England Sportsmen's Show in Boston and the Northeastern Sportsmen's Show in Boxborough.

SOUTHEAST DISTRICT

Louis S. Hambly, Jr.
District Manager

Throughout the fiscal year 1982, the staff of the Southeast Wildlife District continued traditional management and habitat improvement programs and gathered data for a variety of fish and wildlife research projects.

Wildlife

During the fall of 1982, 4,630 cock pheasant were stocked in suitable covers under private ownership and 8,056 cock pheasant and 4,500 bobwhite quail were stocked on wildlife management areas. A total of 200 varying hare were stocked in the open covers and wildlife management areas during February.

Routine maintenance was practiced on all wildlife management areas. This included the planting of 3.0 acres of buckwheat and millett and 2.0 acres of winter rye at the Crane Wildlife Management Area and 4.5 acres of rye at the Myles Standish State Forest Wildlife Management Area. 60 acres of perennial cover were top dressed with lime and fertilizer and 1,150 shrubs and trees were planted in center hedgerows at the Myles Standish Quail Area. One hundred acres was top dressed at the Crane Wildlife Management Area and a total of 350 acres of fields and woods were brushcut. Three new two acre clearings in the Crane Quail Area were laid out and three 500 foot safety zone strips were laid out and cut near the periphery of the quail area and pheasant area due to increased development of adjacent private property.

Other activities conducted on Wildlife Management Areas included the cutting of cedar poles in the Hockomock Swamp Wildlife Management Area by personnel from the Sandwich Game Farm and the cutting of brush and trees from clearings at the Freetown State Forest Wildlife Management Area. District personnel erected and maintained the signs, gates and parking lots at all eight wildlife management areas in the district plus set up the Crane Area for field trails, horse shows, and military training exercises.

In aiding Division research projects, District personnel checked wood duck boxes, and erected bluebird boxes and purple martin houses. They participated in mast surveys, woodcock, mourning dove, and quail census routes. Coastal winter duck banding resulted in 966 ducks being banded. Two biological deer checking stations were operated by district employees and controlled deer hunts for the archery, shotgun and primitive firearms seasons were conducted at the Otis Camp Edwards Military Reservation for 3,434 participants.

Fisheries

In addition to the stocking of 177,000 trout in the streams and ponds of the Southeast Wildlife District, personnel were also involved in conducting surveys of selected ponds and streams to determine the species composition and growth patterns. pH and total alkalinity were sampled on trout ponds to determine their continued suitability for receiving fish due to acid rainfall. In an effort to provide biological control of undesirable fish, 709 smallmouth bass brood stock were salvaged from closed waters and transferred to selected trout ponds.

Fisheries personnel assisted in Division research on tire reefs at Great Herring Pond, Plymouth, the collection of brood stock sea-run brown trout, and in the rearing, stocking and sampling of walleye pike at Assawompsett Pond, Lakeville. The Rochester rearing system was opened to public fishing and a gate was erected at the entrance to improve security of the area.

In addition to the above, personnel routinely maintained trucks and tractors, equipment, buildings and policed the 15,000 acres of Wildlife Management Areas in southeastern Massachusetts.

CENTRAL DISTRICT

Chris Thurlow
District Manager

During fiscal year 1982, personnel from the Central Wildlife District worked on the development and maintenance of seven wildlife management areas. Buildings were maintained or removed from Winimussett and Bolton Wildlife Management Areas. A foot bridge was constructed at the Bolton Wildlife Management Area. Other wildlife management areas receiving attention during fiscal year 1982 were Westboro, Hubbardston, Barre Falls, West Hill and Birch Hill.

Birch Hill Wildlife Management Area personnel spent considerable time developing and constructing storage sheds and overhead doors for all the storage garages and sheds. In addition, they cut and milled 8,000 board feet of pine lumber.

Wildlife

All district personnel assisted in continuing research projects such as the acorn mast study, the salamander breeding census, woodcock and mourning dove census, fur-bearer tagging and operation of deer checking stations. Personnel also assisted in a loon nesting platform study on Worcester Water Supply Reservoirs, constructed the Eagle Hacking Tower for Bald Eagle Re-introduction on the Quabbin Reservoir, and assisted the University of Massachusetts, Bear Tagging Study leader in monitoring a radio-collared bear roaming Worcester County.

During the winter months, district personnel checked and maintained 250 wood duck nesting boxes, repaired and maintained trucks and provided similiar service to other equipment.

District game personnel tagged and conducted a pheasant banding study to evaluate open covers. 16,260 cock pheasants were released in eleven wildlife management areas and 47 towns. 1,670 sportsmen's club birds were delivered and 850 excess brood stock hens were released in suitable covers. 220 snowshoe hare were released.

Other district activities included handling of nuisance animal complaints, delivering permits and licenses, checking nuisance beaver and deer complaints.

Fisheries

District fisheries personnel conducted field surveys of 27 streams and eight ponds. In the spring, 154,100 trout were stocked into 101 streams and 32 ponds. In the fall, 12,250 trout were stocked into 10 ponds. In addition, 7,500 tiger muskie hybrids were stocked into five ponds. Other activities included transferring landlocked alewives from Congamond Reservoir to Lake Chauncy and South Pond. Vandalism cancelled smelt egg collection at the Wachusett Reservoir.

Miscellaneous

Considerable time was spent setting up and staffing fish and wildlife exhibits at the Eastern States Exposition in Springfield, and Sportsmen's Shows in Boston and Boxboro.

District personnel assisted the Division of Law Enforcement during the deer season, fishing season and smelt runs.

CONN. VALLEY DISTRICT

Herm Covey
District Manager

Wildlife

The District Game Section stocks pheasants, snowshoe hare and delivers young birds to various clubs under the pheasant rearing program. They handle numerous complaints of animals causing problems such as beaver, raccoon, skunk, squirrels, deer, bear and coyote.

They monitor pheasant covers open to hunting and assist the Division of Law Enforcement, on request, during deer season, assisting officers as needed.

The District stocks all town covers that are open to hunting just before the open season, and selected covers three to four times during the season through mid-November. Management areas are stocked just before the season opens and usually twice a week through most of November. Birds provided for club rearing programs are free to those clubs that enroll and meet certain criteria. These birds are released at maturity into local covers. Surplus brood stock are released in early June. They are capable of producing late hatches to supplement any native birds grown in the wild.

Broodstock Release

	Cocks	Hens
Club Rearing Program	1,430	65
Broodstock Released	333	2,405
Total - Both Sources	1,763	2,470

Prior to Hunting Season

	Cocks
Open Covers - Towns	10,796
Management Areas	4,416
Total Fall Release	15,212

During fiscal year 1982, other activity was conducted under specific projects as follows:

Wildlife

Besides routine surveillance of each wildlife management area, the activities include maintenance of gravel roads and parking lots, unloading and spreading lime and fertilizer, planting trees and shrubs, replacing and maintaining boundary markers and signs, plowing snow, maintaining vehicles and equipment, installing culverts, maintaining buildings and grounds, replacing gates, pruning trees, frost seeding exposed areas, cleaning up roadside trash, and maintaining wood duck nesting boxes in the District.

District personnel deliver doe permit applications, licenses, law abstracts, primitive weapons, hunting stamps, turkey hunting applications, and waterfowl applications to town clerks and other license outlets. They operate deer check stations at Williamsburg and Belchertown, as well as a turkey checking station in Greenfield. They assisted biologists netting mature turkeys and relocating them to other areas of the state. They monitored mourning dove census routes and continued the study of mast crops.

The district maintains records on species taken by licensed sportsmen such as deer, bear, coyotes, beaver, bobcat, otter and fisher. We participate in the bear study project of the Wildlife Co-Operative Unit at the University of Massachusetts, capturing, tagging and installing radio transmitters on the black bear to monitor movement, assess range and identify populations. In addition, the district handles nuisance bear complaints and instructs bee keepers on ways to prevent damage.

A controlled waterfowl hunt is conducted on the Ludlow Wildlife Management Area. Permanent blinds are maintained on the area for photography and nature observation during the closed season. District personnel maintain wood duck nesting boxes and collect blood samples from waterfowl taken by hunters.

Fisheries

Trout stocking is another major function of the Districts. This district stocks selected ponds in mid-winter for ice fishing interests and selected ponds and streams in the fall. Most of the allotment is however scheduled for release in April, May and June.

Total Trout Stocked

Ponds	6"-9"	14,200 Fish =	3,706 lbs.
	9+"	60,950 Fish =	41,676 lbs.
Streams	6"-9"	74,000 Fish =	19,321 lbs.
	9+"	34,100 Fish =	23,356 lbs.
Totals	6"-9"	88,200 Fish =	23,027 lbs.
	9+"	95,050 Fish =	65,032 lbs.
Grand Totals		183,250 Fish =	88,059 lbs.

In addition to trout stocking, the District fisheries staff assisted other districts with manpower and equipment to complete their stocking programs. We continue to monitor pH in streams and ponds prior to stocking, give technical advice to the public on specific water related problems, repair and maintain equipment, and respond to other state and federal agencies in need of information or assistance.

Fisheries research activity is conducted under specific projects as follows:

Conn. River Atlantic Salmon Restoration

The district provided 44 man days monitoring fish passage at Turners Fall Dam Fishway viewing window. Staff assisted in the site selection process to locate the new adult Atlantic salmon holding station with the Federal Fish and Wildlife Coordinator. Two radio interviews on the restoration program helped to explain the programs.

Fisheries Survey and Inventory

District staff continued to assess fish populations in selected lakes and streams. They conducted creel checks and maintained electrofishing gear.

Nongame and Endangered Species

The District Manager assisted in the annual eagle count of wintering eagle populations at the Quabbin Reservoir. We also offer assistance as required for the Eagle Hacking Program at Quabbin.

Young Adult Conservation Corps

A corps of young people between the ages of 16 and 23 worked on projects at our hatcheries, game farms and district office under the supervision of a Division employee.

Activities of this corps included cutting woodland borders around field, burning brush, milling and stacking lumber, making signs, picking up trash, fertilizing and liming fields, planting shrubs, landscaping, repairing ranges, constructing raceways, installing fish propagation tanks, repairing water control structures, maintaining project equipment. Unfortunately, the federal funding was withdrawn and the program ended.

WESTERN DISTRICT

Tom Keefe
District Manager

Wildlife

Personnel from the Western District participated actively in many of the Division's research activities. To do this, they manned deer check stations during archery, shotgun and primitive firearms seasons and they participated as hosts in the Berkshire section of the special deer hunt for paraplegic sportsmen. In all, and including the time needed to distribute antlerless deer permit applications, as well as time needed to investigate non-hunting deer mortality reports, approximately 88 man days were spent on deer research.

A district wide census was conducted as in the past to determine numbers of mourning doves and woodcock. Within these surveys, district staff conducted four dove call routes and two routes which monitored woodcock singing grounds for a total of five man days.

Game personnel investigated sightings and maintained records of turkey sightings throughout the year. They made contact with key landowners and scouted prime turkey areas in preparation for mid-winter live-trapping efforts. During the winter period, district staff worked with the research biologist on trapping and translocating birds. In addition to field work, this involved construction of a net-launching box as well as maintenance of equipment and shipping crates. During the spring turkey season, district staff manned check stations and delivered materials as needed.

Turning their attention to the black bear project, district personnel attended seminars conducted by the Cooperative Wildlife Research Unit, University of Massachusetts, Amherst, on immobilization of bear. They participated in two efforts to radio tag bears and met with a piculturist to discuss prevention of damage to hives.

As in the past, district personnel participated in the collection of carcasses of bobcat, coyote, fisher and otter and the tagging and measuring of pelts; a project which took an estimated 10 man days.

In a study related to the abundance of these and other major game species, personnel surveyed previously marked red and white oak trees throughout the district and tabulated acorn counts. Further investigations into fruit and nut production in other parts of the district were continued as well (10 man days).

Fisheries

Personnel from the Division's fisheries crew were involved in both pond and stream surveys. Data from these investigations will be used to map ponds as well as to determine base line measurements of chemical parameters which can be used for future research. Approximately 63 man days were expended on these projects.

Nongame Projects

Western District personnel participated in the annual January eagle watch covering western Massachusetts and monitoring areas where eagles might be found. Staffers also participated in a summer survey for the nongame program, this one assisting the Assistant Director for Nongame and Endangered Species in locating colonies of great blue herons and conducting an inventory of birds using these rookeries. Total time expended on these nongame projects estimated at approximately 6.5 man days.

Maintenance of Wildlife Management Areas

This program involved a wide variety of minor but time consuming maintenance and area improvement tasks. Personnel maintained the storage buildings at the District Headquarters, and at the Housatonic Valley and Stafford Hill Wildlife Management Areas. They maintained a footbridge on the Hinsdale Flats Wildlife Management Area and nine parking lots on five management areas (Housatonic Valley, Stafford Hill, Knightville, Eugene Moran and Hy Fox). In addition, they limed a ½ mile trail on the Hy Fox Wildlife Management Area, mowed and cleared a three mile trail on the Housatonic Valley Wildlife Management Area and raked and maintained culverts on a ½ mile road on the Moran Wildlife Management Area. Boundaries were maintained and markers were placed on 6.2 miles of wildlife management boundary.

A total of 161 acres on four wildlife management areas were placed into farming or grazing under agreements between private cooperators and the District. Personnel monitored cooperators' activities including cutting dates, liming and fertilizing, fence maintenance and fee collection to assure conformity with the agreements.

District staff mowed a total of 35.5 acres on six wildlife management areas and maintained a total of 129 wood duck nesting boxes on these areas.

Project administration and custodial functions on management areas occupied an estimated total of 53.5 man days.

Stocking

Stocking of game and fish constitute an important part of the activities of any district and this district undertook four stocking operations during fiscal year 1982.

	Hens	Cocks
Pheasants -		
Spring Releases	484	76
Club Reared Birds		440
Fall Stocked, Towns		2810
Fall Stocked, WMA's		3460
	484	6788

Grand Total - 7,272

White Hare -

111 released on the following areas:

Peru, Moran, Savoy, Hinsdale Flats, and Windsor State Forest

Trout -

173,000 brown, brook and rainbow trout released into area ponds, lakes and streams.

Kokanee Salmon -

30,000 kokanee were released into Onota Lake, Pittsfield and Laurel Lake, Lee. This will be the final stocking of this species into Massachusetts waters.

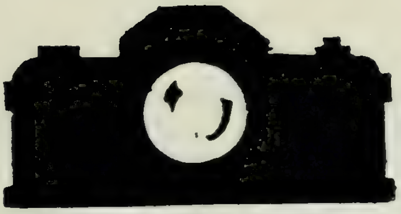
Tiger Muskies -

Were released into four district ponds. Approximately 3,580 of these northern pike hybrids were released into Pontoosuc Lake, Pittsfield, and Otis Reservoir.

The fish stocked were 5"-8" long. They were stocked in Otis, Upper Spectacle Pond, Sandisfield and 1,000 acre ponds in New Marlboro. They become legal in the creel at 28".

Miscellaneous

In addition to the activities detailed above, district personnel continued to provide services in other areas as in previous years. Prime among these services is technical assistance to state, federal and private agencies as well as to private individuals. Another major service of the District involves dealing with complaints about animal damage. 23 man days were spent evaluating and processing deer damage reports and 51.5 man days were spent dealing with complaints about beaver activity. Other activities involved outreach through participating in shows such as the Eastern States Exposition which involved 16 man days and routine participation in local exhibitions and meetings.



INFORMATION & EDUCATION

Eleanor C. Horwitz
Chief
Information and Education

The Information and Education Section continued to address its mandate of disemminating information about wildlife to specific and general publics and by providing educational programs where and as possible. As in the past, the most time consuming portion of this was direct response to public inquiries by telephone and letter. All requests received were handled as were numerous requests for story material from writers who subsequently used such materials to publicize wildlife opportunities and to promote a greater understanding of wildlife among their readership.

Press Releases

In addition to responding to direct inquiries, the section maintains an open line of communication with outdoor writers, sportsmen's clubs, conservation groups and town clerks through irregularly issued press releases. Effective distribution of releases requires up-to-date mailing lists. To this end, two of the Division's lists -- the list of writers and the list of sportsmen's clubs underwent extensive purging and revision. The results were a notable decrease in number of items per mailing with an increase in release use as shown through press clipping analysis. During fiscal 1982, the section issued 17 press release packets comprising 97 items plus ten "Tips to Outdoor Writers" which are mailed directly to active members of the working press. Fifteen items were issued as "Tips" bringing the total of release items to 112. Returned newsclips were analyzed as received and it was noted that during 1981, the Division received an average of 150.5 clips per month with two months registering 200 clips or better.

Publications

As a further aid in responding to public inquiry and in keeping the public abreast of news and regulations, the section prepares, maintains and updates a variety of publications including Abstracts of Fish and Wildlife Regulations, Abstracts of Regulations Pertaining to Migratory Birds, spring and fall trout stocking lists, lists of deer checking stations, sportfishing awards weighing stations, maps available through the Division, and waters for fishing bass, northern pike and tiger muskies.

During this year, the section began a major reprinting and reorganization of its file of 200+ maps of ponds and wildlife management areas throughout the state. Map files are being alphabetized, stocks are being replenished and where needed, maps are being redrawn. Some of the information contained in the maps and in the aforementioned lists has been used for informational flyers and leaflets including a fishing flyer prepared for the Division by the Boston Globe and a sportsman's guide prepared by Procupine Enterprises through the Middlesex News.

A number of special publications were issued this year, among them natural history flyers on the coyote, snipe, brown bullhead, yellow perch, a guide for handicapped sportsmen entitled "A Handicap is not a Disability", a manual on Bowhunting in Massachusetts and a technical monograph entitled The Wood Duck in Massachusetts.

Preparation of "Wildlife Portraits," a series of articles and photographs provided without cost to newspapers, was halted due to decreased manpower and a reduction in use.

During this year, we noted with sadness the untimely passing of Massachusetts Wildlife editor Jack Clancy. His position was assumed by Peter Mirick, Conservation Helper in the Wildlife Section who had produced "Wildlife Portraits". Although continuing his duties as leader of the Mast Evaluation Project and coordinating the first statewide Salamander Survey, Mirick prepared three issues of Massachusetts Wildlife. In addition, Mirick carried responsibility for section operations while Section Chief Ellie Horwitz was on maternity leave from October 1981 through March 1982.

Displays

Audio-visual personnel continued to provide outstanding support to all sections of the Division documenting projects and providing photographs and film as needed for presentations of all varieties. These presentations included regulatory sessions before the Fisheries and Wildlife Board, talks to sportsmen's clubs, civic organizations and school groups. A special educational seminar was held during this period by Mr. James Kenelly, University of Massachusetts. The seminar dealt with new procedures and techniques to improve graphics used in presentations by biologists and offered the staff suggestions for more effective ways to utilize the capabilities of the Division's photographic resources.

In addition to providing support services, the photographers prepared large displays focussing on Atlantic salmon for use at the Eastern States Exposition in Springfield, the Sportsmen's Show in Boston and the Eastern Fishing Exposition in Boxborough. In addition to preparation, transport and maintenance of the major displays, they provided photographs for numerous small displays which were used at smaller exhibitions and special events. Two display boards were constructed to hold variable materials and a folding display board was created to feature Division publications.

Filming continued with special emphasis on shorebirds and on the eagle restoration project and footage was filed for future use. A slide show on reptiles and amphibians was completed as was one for young audiences on Wildlife in Massachusetts. This latter will be issued in cooperation with the

Massachusetts Wildlife Federation. While not completed, work continued toward creation of a nongame slide show for the Commonwealth.

Conservation Camp

The section continued its traditional role as publicity agency and registration center for the Massachusetts Junior Conservation Camp in Spencer. In addition to providing needed pre-camp services, Section staff members made arrangements for teaching programs, tours, fish stocking and actually taught sessions on fisheries and wildlife. As co-sponsors of the camp, the Division was involved throughout the program up to and including graduation and the awards ceremony. Section staff also provided educational sessions for the Marlboro Junior Conservation Camp.

Stamps

An archery/primitive firearms stamp design was donated by artist Randy Julius of East Bridgewater. This design was reproduced and the 1981 stamp sold to all bowhunters pursuing deer and to participants in the three day primitive firearms season on deer in addition to stamp collectors.

The 1981 waterfowl stamp competition, held to select the design for the 1982 stamp, drew more than 40 entries to the judging and exhibition held at the Peabody Museum in Salem. The winning painting was John Eggert's rendition of a Greater Yellowlegs carved by Fred Nichols of Lynn.

Special Promotions

More than 400 applicants received bronze pins through the Freshwater Sportfishing Awards Program. Two of them established new state records, Nicholas Lambert with a 30 lb. 4 oz. carp and Fred Goodwin with a 7 lb. 4 oz. white catfish.

The Tags 'n' Trout Program continued operation with somewhat tightened regulations. This year, sponsors were required to honor each tag with a prize worth $20 or better to avoid angler disappointment after often extensive drives to collect their prizes. In all mine groups, 190 tagged fish provided sportsmen with an opportunity to glean $3800 of prizes.

Undoubtedly, the most exciting special promotion came with the inititaion of the eagle restoration project under the leadership of audio-visual supervisor Jack Swedberg. Under Swedberg's leadership, a 30 foot tower was constructed on the shores of Quabbin Reservoir (see nongame report) and two eaglets arrived on June 11 commemorating the 200th anniversary of the selection of the bald eagle as the national symbol of the United States. This brought many interviews and drew attention to the Division and specifically to the emerging nongame program. A press day which drew 37 media representatives was hosted on June 18 and media interest remained high.

Other

This year's Section efforts were especially assisted by intern Dan Monahan who undertook the project of clearing out and cleaning portions of the Hunting and Fishing Museum collection.

REALTY

Floyd Richardson
Chief of Wildlife Lands

Historically, this agency has reluctantly divested title to property in its ownership and then only for specific reasons. Public need however, in the form of water supply, highway construction, utilities, etc., takes precedence over wildlife demands placing the Division in a tenous, yet conciliatory situation.

Proposition 2½ spawned severe financial restraint curtailing planned programs and influenced every segment of government. Because of these restrictions, Podick Springs, a satellite station to the Sunderland Hatchery was destined to cease operations. The sixty acres, buildings and raceways, would (inevitably) fall victim to vandals. At the same time, however, the U. S. Fish and Wildlife Service was formulating plans for the construction of a salmon holding facility in conjunction with the restoration of the anadromous Atlantic Salmon in the Connecticut River. Podick Springs with its proximity to the Connecticut River was ideally suited. A transfer of the hatchery from state to federal control would certainly be in the best interests of the Commonwealth. The hatchery would remain operative and productive thereby enhancing the salmon restoration project. If in the future the U. S. Fish and Wildlife Service suspended operations and declared the property surplus, the Division would have preference in reacquiring by transfer. Consequently, a transfer of the hatchery was enacted by Chapter 741 Acts of 1981 becoming effective January, 1982.

Our acquisition program continued in a low-key manner with the limited funds available.

Nine parcels were acquired totalling two hundred and forty-three acres. Six of the parcels were given to our agency by conservation-minded persons.

Their names and property locus are as follows:

Kingsley Fall	Pittsfield	2.0 acres
Mary Weston	Pittsfield	6.3 acres
Alex & Cecil Gaylord	Pittsfield	5.9 acres
Francis Paddock	Lenox	15.0 acres
Lucretia Ilsley	Newbury	5.7 acres
A. Stakutis	Brookfield	3.5 acres

The Division of Fisheries and Wildlife is extremely appreciative to the above-named for their generosity.

HOUSATONIC RIVER ACQUISITION PROJECT

811.4 acres

Four parcels of property adjacent to the Housatonic River were given to this agency. These gifts enlarge the area by twenty-nine acres.

WINDSOR ACQUISITION PROJECT

1102.0 acres

The western perimeter of this management area contains some of the best wildlife cover and habitat the Berkshires have to offer. The addition of two parcels, with a combined acreage of 80 acres, provide protection and access.

DOWNFALL ACQUISITION PROJECT

1486.0 acres

Another important segment of wildlife property was vested into the Division. This parcel of woodland and marshland converge to offer ideal wildlife habitat. Additionally, this parcels' importance is mirrored by the fact it was the only privately owned parcel within our management area in that particular sector.

QUABOAG ACQUISITION PROJECT

1045.6 acres

Situated on the southwestern side of Quaboag Pond and also fronting the Quaboag River, this valuable parcel provides additional protection and enlarges the corridor presently owned by the Division.

MILLERS RIVER ACQUISITION PROJECT

1857.3 acres

Access, parking and excellent wildlife cover, are but a few of the features offered by this property. Mixed stands of hard and softwoods, occasioned by lowland marshed and woodsroads combine to provide an ideal wildlife area that abuts other wildlife lands in Division stewardship.

SUMMARY OF LAND ACQUISITION

FISCAL YEAR 1982

AREA NAME	TOWN	ACREAGE
Housatonic River	Pittsfield Lenox	14.20
Moran Area	Windsor	80.00
Downfall Area	Newbury	5.70
Quaboag River	Brookfield	3.50
Millers River	Athol	125.00
	Total	243.40

Maintenance & Development

John P. Sheppard
Chief
Maintenance and Development

Some of the activities of this section have already been mentioned under hatchery improvement activities. A summary of engineering and development projects for fiscal 1982 is noted here.

Hatcheries

Work was completed at the East Sandwich station of the Sandwich Fish Hatchery. The work consisted of construction of an underground water supply and drainage system, a new hatch house, roof structure, security fencing, a two-stage vertical group and bowl assembly and 15 exterior and 18 interior tanks. Dedication of said facility as the Arthur Sullivan Anadromous Fish Hatchery took place in the fall of 1981. Because of the insufficiency of the existing well water supply at this station, a contract was awarded to redevelop the existing supply well.

At the main station of the Sandwich Fish Hatchery, a contract was awarded for a new gravel packed well.

At the Palmer Experimental Salmon Station, six new tanks were delivered for use in the tiger muskie project. A new pump was installed and associated well work completed. A new 1,300 foot water distribution line was completed at this facility and the existing entrance roadway was paved.

A vertical turbine pump and bowl assembly was installed at the McLaughlin Trout Hatchery in Belchertown.

During this period, new roofs were installed on existing structures at the Montague and Sunderland Fish Hatcheries.

Districts and Management Areas

A contract was awarded for the regrading of the existing roadway and parking lot at the West Meadows WMA in West Bridgewater. Structural steel security gates were installed at a number of locations on wildlife management areas statewide.

Other

The engineering section also provided technical assistance to other agencies within the Department including assistance to the Public Access Board for boat ramps at Comet Pond, Hubbardston, Snipatuit Pond, Rochester, Monponsett Pond, Halifax and the Charles River in Waltham among others.

PERSONNEL ACTIONS

Sixty-one personnel changes were undertaken during this fiscal year with the majority being promotions and retirements. The Division notes with sorrow the passing of William Humberstone, Skilled Conservation Helper at the Sandwich Game Farm, on October 13, 1981.

Retirements

Name	Job Title	Date
M. Perry	Junior Clerk & Typist	08-14-81
P. Mugford	Senior Land Use Planner	09-04-81
W. Saville	District Wildlife Manager	02-06-82
F. Bohlman	Conservation Skilled Helper	01-30-82
J. Bigos	Conservation Helper	01-29-82
L. LaBrie	Conservation Skilled Helper	09-25-81
P. Mahoney	Game Bird Culturist	08-12-81
W. Jajuga	Game Bird Culturist	09-04-81
J. Robinson	Conservation Skilled Helper	12-05-81
J. Kennedy	Fisheries Manager	04-23-82

Resignations

S. Chase	Senior Clerk & Typist	11-28-81
E. Pignatello	Senior Clerk & Typist	08-17-81
C. McEvoy	Senior Clerk & Stenographer	09-27-81
M. Brazauskas	Conservation Helper	04-27-82
J. Jonasch	Assistant Aquatic Biologist	08-08-81
P. Collins	Conservation Helper	07-24-81
K. Hickey	Conservation Helper	09-26-81

Appointments

S. Foster	Conservation Helper	05-12-82
W. Davis	Conservation Helper	04-27-82
J. Kirvin	Conservation Helper	06-30-82

Appointments (Continued)

Name	Job Title	Date
M. Dumont	Conservation Helper	06-27-82
K. Amara	Junior Clerk & Typist	06-14-82

Promotions

Name	Job Title	Date
M. Berberian	Prin. Clerk & Sec. to Dept. Head	12-13-81
T. Keefe	District Wildlife Manager	03-09-82
C. Smith	Confidential Secretary	12-13-81
N. Limosani	Senior Clerk & Stenographer	02-14-82
D. St. James	Conservation Skilled Helper	03-22-82
W. Dauderis	Assistant Fish Culturist	05-23-82
A. Akins	Assistant Fish Culturist	09-30-81
E. Bolduc	Conservation Skilled Helper	05-02-82
L. Hollings	Conservation Skilled Helper	06-13-82
H. Krieser	Conservation Helper	03-21-82
W. Davis	Conservation Skilled Helper	05-24-82
P. Orizzi	Conservation Skilled Helper	05-24-82
A. Minalga	Game Bird Culturist	09-29-81
J. Boudreau	Game Bird Culturist	03-14-82
G. Galas	Conservation Skilled Helper	05-16-82
K. Condon	Senior Clerk & Typist	02-21-82
C. Ayers	Assistant Fish Culturist	08-30-81
F. Sorocco	Principal Clerk	02-14-82
A. Scotia	Principal Clerk	03-21-82
P. Mirick	Publicity Agent	10-04-81
E. Garofano	Head Clerk	01-23-82
R. Costello	Senior Bookkeeper	12-15-81
A. Gola	Wildlife Rest. Proj. Field Agent	05-02-82

Other

Name	Job Title	Date
J. Nowakowski	Conservation Helper	01-06-82
D. Spigarolo	Junior Bacteriologist	06-28-81
E. Horwitz	Publicity Agent	04-04-82
N. Limosani	Senior Clerk & Typist	01-04-82
D. Viera	Conservation Helper	06-29-91
M. Brideau	Conservation Helper	07-19-81
P. Orizzi	Conservation Helper	04-04-82
G. Galas	Conservation Helper	03-28-82
J. Dixon	Fisheries Manager	05-25-82
R. Lewis	Junior Clerk & Typist	02-24-82
K. Corey	Junior Planner	04-16-82
S. Townsend	Conservation Helper	05-02-82
P. Mirick	Wildlife Journalist	04-04-82
T. Staples	Conservation Skilled Helper	05-16-82
R. Costello	Senior Clerk & Typist	03-21-82

LEGISLATION

Enacted During Fiscal Years 1981 and 1982

Chapter 76 - Acts of 1981. An Act Establishing the Sandy Neck Governing Board of the Town of Barnstable.

Chapter 268 - Acts of 1981. An Act Providing a Penalty for the Possession of an Altered, Forged or Counterfeited License to Carry a Firearm or a Firearm Identification Card.

Chapter 286 - Acts of 1981. An Act Further Regulating the Sale of Ducklings.

Chapter 541 - Acts of 1981. An Act Further Regulating the Sale of Ammunition.

Chapter 571 - Acts of 1981. An Act Providing for Economic Incentives for Consumers to Return Used Beverage Containers and to Encourage the Conservation of Materials and Energy Through the Recycling and Reuse of Such Containers.

Chapter 597 - Acts of 1981. An Act Further Regulating the Sale and Transfer of Firearms.

Chapter 598 - Acts of 1981. An Act Further Regulating the Sale of Firearms.

Chapter 628 - Acts of 1981. An Act Providing for a Massachusetts Clean Lakes and Great Ponds Program.

Chapter 661 - Acts of 1981. An Act Relative to the Use of Certain Weapons During the Primitive Hunting Season.

Chapter 716 - Acts of 1981. An Act Concerning the Establishment of a Connecticut River Atlantic Salmon Commission.

Chapter 741 - Acts of 1981. An Act Authorizing the Division of Capital Planning and Operations to Convey Certain Land in the Town of Sunderland to the Department of the Interior, Fish and Wildlife Service.

Chapter 758 - Acts of 1981. An Act Relative to Certain Fish and Game Fees (Increase Fee Retained by Clerk).

Chapter 760 - Acts of 1981. An Act Transferring the Division of Law Enforcement from E.O.E.A. to the Department of Fisheries, Wildlife and Recreational Vehicles.

Chapter 767 - Acts of 1981. An Act Providing for Certain Improvements of the Personnel Administration in the Commonwealth and its Political Subdivisions (Civil Service Reform).

Chapter 808 - Acts of 1981. An Act Making Appropriations for the Fiscal Year Ending June 30, 1982 to Providing for Supplementing Certain Existing Appropriations and for Certain New Activities and Projections ($400,000 authorized a budgetary supplement).

Chapter 39 - Acts of 1982. An Act Providing for the Use of Special Equipment by Handicapped Hunters.

Chapter 287 - Acts of 1982. An Act Relative to the Acquisition by the Department of Environmental Management of South Cape Beach Town of of Mashpee.

Chapter 602 - An Act Authorizing the Commissioner of Administration to Set Fees and Charges Paid to the Commonwealth.

FINANCIAL REPORT

Nancy Melito
Head Administrative Assistant

As the Division continued in the 1982 fiscal year to reduce expenditures and realize revenues, wherever possible, the Inland Fish and Game Fund notably evolved from a deficit condition (-$66,885.) at the beginning of the year to a surplus of $137,334. at fiscal closing on June 30, 1982.

Additional financial information, as detailed below, has been included in this year's annual report to summarize how the Inland Fish and Game Fund surplus or deficit is determined at the close of the accounting cycle. Also, the format of the "Summary of Revenue Credited to the Inland Fish and Game Fund" has been changed through the use of categorical headings which it is hoped will more clearly illustrate revenue sources.

CHANGES IN
FISH AND GAME FUND BALANCE
July 1, 1981 to June 30, 1982

1981 Continuing Accts. Brought Forward		1982 Continuing Accts. Brought Forward	
0612-1000		0612-1000	
Retirement Assessment	$22,219.82	Retirement Assessment	$17,271.48
2310-0300		2310-0300	
Dev. & Imp. of Facilities for Public Use	64,245.91	Dev. & Imp. of Facilities for Public Use	39,262.45
		2350-0100	
		*Law Enforcement	52,500.00
		Reserve for Encumbrances	14,894.48
	$86,465.73		$123,928.41

1982	$123,928.41
1981	-86,465.73
	$ 37,462.68 (Increase)**

Balance July 1, 1981 (Deficit)	-$ 66,885.30
Total Revenue/Credits	+ 4,937,836.50
Total Expenditures	- 4,696,154.39
Increase in Continuing Accts. Brought Forward	- 37,462.68**
Balance June 30, 1982 (Surplus)	+$ 137,334.13

*$52,500. Supplementary Appropriation for Division of Law Enforcement

COMMONWEALTH OF MASSACHUSETTS
DIVISION OF FISHERIES AND WILDLIFE
July 1, 1981 to June 30, 1982

"HOW THE SPORTSMEN'S DOLLAR WAS SPENT"

	Account No.	Expenditures		Percentage
Administration				
Administration	2310-0200	$ 454,441.29		
Information-Education	2310-0200	141,831.99	$ 596,273.28	12.70%
Wildlife Programs				
Game Farms	2310-0400	778,382.17		
Wildlife Management**	2310-0400	664,477.03		
Wildlife Cooperative Unit	2310-0400	18,000.00	1,460,859.20	31.10%
Fisheries Programs				
Fish Hatcheries	2310-0400	697,203.74		
Fisheries Management**	2310-0400	406,252.85		
Fisheries Cooperative Unit	2310-0400	18,000.00	1,121,456.59	23.88%
Nongame and Endangered Species Program				
Administration, Management and Research	2315-0100		32,202.79	.69%
Land Acquisition				
Acquisition of Upland Areas and Inholding on Existing Areas***	2310-0310		49,931.19	1.06%
Engineering and Construction				
Development and Improvement of Facilities for Public Use*	2310-0300		85,210.87	1.82%
Dept. of Fisheries, Wildlife and Recreational Vehicles				
Natural Resource Officers' Salaries and Expenses	2020-0100 (30%)		439,491.93	9.36%
Hunter-Safety Training****	2020-0300 (100%)		66,311.69	1.41%
Transfers from Fund				
Group Insurance	1590-1007		246,237.27	5.24%
Salary Adjustments			48,385.00	1.03%
Retirement Assessment (.2%)	0612-1000		283,286.33	6.03%
Interest on Bonded Debt	0699-2800		67,508.25	1.44%
Maturing Serial Bonds and Notes	0699-2900		199,000.00	4.24%
Total Expenditures			$4,696,154.39	100.00%

* Continuing Appropriation
** Portions of expenditures 60% or 75% reimbursable by Federal Government
*** Certain land acquisitions are 50% reimbursable by Federal Government
****100% reimbursable by Federal Government

APPROPRIATIONS AND EXPENDITURES

Fiscal Year July 1, 1981 to June 30, 1982

Account No.		Appropriations	Expenditures & Liabilities	Total Reversions
2310-0200	Administration	$ 624,530.00	$ 596,273.28	$ 28,256.72
2310-0310**	Acquisition of Upland Areas & Inholding on Existing Areas	50,000.00	49,931.19	68.81
2310-0400*	Wildlife Management	2,767,040.00	2,582,315.79	184,724.21
2315-0100	Non-Game Management and Research	34,700.00	32,202.79	2,497.21
		$3,476,270.00	$3,260,723.05	$ 215,546.95

		Continuing Appropriation	Expenditures	Balance Forward
2310-0300	Development & Improvement of Facilities for Public Use	$ 139,367.80	$ 85,210.87	$ 54,156.93

*** CAPITAL PROJECTS

		Appropriations	Expenditures	Balance Forward
2670-9016**	Acquisition of Coastal & Inland Wetlands	$ 20,045.49	$ 9,500.00	$ 10,545.49
2670-9022	Fish Screens, Quabbin	4,020.37	-	4,020.37
		24,065.86	$ 9,500.00	$ 14,565.86

* Portions of expenditures 60% or 75% reimbursable by Federal Government

** Certain land acquisitions are 50% reimbursable by Federal Government

*** 1983 expenditures of $9,500. in Capital Projects are not shown "per se" in "How the Sportsmen's Dollar Was Spent" as these bond projects are expensed against the Inland Fish & Game Fund through payments processed in Account No.0699-2800 (Interest on Bonded Debt) and 0699-2900 (Maturing Serial Bonds and Notes).

SUMMARY OF REVENUE CREDITED
to the
INLAND FISH AND GAME FUND
July 1, 1981 to June 30, 1982

Collected by Agency:

Fishing, Hunting & Trapping Licenses*	3304-61-01-40	$3,236,960.0
Trap Registrations*	3304-61-01-40	1,287.5
Archery Stamps*	3304-61-01-40	90,851.4
Waterfowl Stamps*	3304-40-01-40	7,847.5
Waterfowl Stamps-Ducks Unlimited	3304-40-02-40	22,876.0
Special Licenses, Tags & Posters**		11,363.1
Antlerless Deer Permits	3304-61-14-40	12,200.0
Bear Permits	3304-61-14-40	982.0
Turkey Permit Applications	3304-61-14-40	4,273.0
Turkey Permits	3304-61-14-40	13,320.6
Rents	3304-63-01-40	18,705.2
Refunds Prior Year	3304-69-01-40	492.5
Sales, Other	3304-64-99-40	11,745.1
Miscellaneous Income	3304-69-99-40	2,682.0
		$3,435,586.0

Collected by State Treasurer:

Fines and Penalties	3308-41-01-40	30,338.5
Interest and Discount on Revenue	3395-60-01-40	8,056.5
		$ 38,395.0

Federal Aid Reimbursements:

Pittman-Robertson Federal Aid	3304-67-01-40	$ 432,759.9
Dingell-Johnson Federal Aid	3304-67-02-40	174,534.1
Anadromous Fish Projects- Federal Aid	3304-67-04-40	67,738.9
Endangered Species Federal Aid	3304-67-11-40	20,010.7
Indirect Cost Reimbursement	3304-67-67-40	229,167.8
		$ 924,211.6

Taxes:

Gasoline Tax Apportionment	3312-05-01-40	$ 372,050.8

Transfers from General Fund:

Salary Adjustments	$ 48,385.0
Reimbursement on Half Price Licenses	67,671.7
	$ 116,056.7

Reversions (Accounts Payable)	$ 51,536.2
Total Revenue:	$4,937,836.5

*See Detail Sheet #1
**See Detail Sheet #2

DIVISION OF FISHERIES AND WILDLIFE
RECEIPTS FROM FISHING, HUNTING AND TRAPPING LICENSES
Fiscal Year July 1, 1981 to June 30, 1982

Type of License Class	Unit Price*	Quantity	Gross Amount	Fees Retained by City/Town Clerks	Net Returned to Commonwealth
01 Res. Cit. Fishing	11.25/12.50	114,351	1,373,239.25	37,455.50	1,335,783.75
02 Res. Cit. Hunting	11.25/12.50	50,052	564,123.50	11,420.25	552,703.25
03 Res. Cit. Sporting	16.50/19.50	58,411	1,025,068.00	20,676.25	1,004,391.75
04 Res. Cit. Minor Fishing	6.25/ 6.50	8,114	51,925.00	2,768.50	49,156.50
05 Res. Alien Fishing	14.25/14.50	963	13,866.75	333.75	13,533.00
06 Non-Res. Cit./Alien Fishing	17.25/17.50	4,191	72,858.25	1,317.00	71,541.25
07 Non-Res. Cit./Alien 7-Day Fishing	11.25/11.50	1,885	21,292.75	386.75	20,906.00
08 Non-Res. Cit./Alien Hunting (Small Game)	23.25/23.50	979	22,769.25	249.50	22,519.75
09 Non-Res. Cit./Alien C.S.P. 3-day Hunting	19.25/19.50	34	658.75	13.00	645.75
10 Res. Cit. Minor Trapping	6.25/ 8.50	358	2,246.50	89.00	2,157.50
11 Res. Cit. Trapping	14.50/20.50	1,214	17,735.00	340.25	17,394.75
12 Duplicates	2.00	3,480	6,960.00	-	6,960.00
13 Res. Alien Hunting	19.25/19.50	1,312	25,264.75	388.75	24,876.00
14 Non-Res. Cit./Alien Hunting (Big Game)	38.25/48.50	1,187	45,648.75	293.25	45,355.50
15 Res. Cit. Sporting (Over 70)	FREE	19,357			
16 Res. Cit. Fishing (Blind, Paraplegic, Mentally Retarded)	FREE	1,512			
17 Res. Cit. Hunting (Paraplegic)	FREE	129			
18 Res. Cit. Fishing (Age 65-69)	5.75/ 6.25	6,206	37,307.00	2,540.25	34,766.75
19 Res. Cit. Hunting (Age 65-69)	5.75/ 6.25	721	4,160.75	203.25	3,957.50
20 Res. Cit. Sporting (Age 65-69)	8.25/ 9.75	2,980	25,804.50	1,271.50	24,533.00
21 Res. Cit. Trapping (Age 65-69)	7.25/10.25	98	725.50	33.50	692.00
		277,534	3,311,654.25	79,780.25	3,231,874.00
22 Archery/Primitive Firearms Stamp	5.10	18,045	92,029.50	1,515.80	90,513.70
		295,579	3,403,683.75	81,296.05	3,322,387.70
Archery Stamps/Sets (Collectors)			337.70		337.70
Delinquent Account Collections			3,158.00		3,158.00
			3,407,179.45		3,325,883.40
**Trap Registrations			1,287.50		1,287.50
			3,408,466.95		3,327,170.90
Redeposit of bad checks from previous year			1,928.00		1,928.00
			3,410,394.95		3,329,098.90
23 Waterfowl Stamps	1.25	28,601	35,751.25	5,027.75	30,723.50
		324,180	3,446,146.20	86,323.80	3,359,822.40

* License increase effective March 1, 1982

**Trap Registrations:		
Initial:	247 @ $2.00	$494.00
Renewal:	529 @ $1.50	793.50
		$1,287.50

SPECIAL LICENSES, TAGS AND POSTERS
July 1, 1981 to June 30, 1982

Receipt Account	Type of License	Quantity & Unit Price	Amount	Receipt Account Total
3304-61-02-40	Fur Buyers			
	Resident Citizens:	29 @ 15.00	435.00	
	Non-Residents or Aliens:	8 @ 50.00	400.00	835.00
3304-61-03-40	Taxidermists	92 @ 10.00		920.00
3304-61-04-40	Propagators			
	Special Purpose Permits:	144 @ 1.00	144.00	
	Class 1 (Fish)			
	Initial:	49 @ 7.50	367.50	
	Renewal:	142 @ 5.00	710.00	
	Class 3 (Fish)			
	Initial:	17 @ 7.50	127.50	
	Renewal:	73 @ 5.00	365.00	
	Class 4 (Birds,Reptiles,Mammals)			
	Initial:	113 @ 7.50	847.50	
	Renewal:	525 @ 5.00	2625.00	
	Class 6 (Dealers)			
	Initial:	10 @ 7.50	75.00	
	Renewal:	56 @ 5.00	280.00	
	Additional:	142 @ 1.50	213.00	
	Class 7 (Individual Bird or Mammal)			
	Initial:	6 @ 3.00	18.00	
	Renewal:	33 @ 1.00	33.00	
	Importation Permits			
	Fish:	5 @ 5.00	25.00	
	Birds or Mammals:	45 @ 5.00	225.00	
	Class 9(Falconry)			
	Master:	6 @ 25.00	150.00	
	Apprentice:	23 @ 25.00	575.00	
	General	8 @ 25.00	200.00	
	Class 10 (Falconry)			
	Raptor Breeding:	2 @ 10.00	20.00	
	Class 11 (Falconry)			
	Raptor Salvage:	10 @ 1.00	10.00	7,010.5
3304-61-05-40	Take Shiners:	119 @ 5.00		595.0
3304-61-06-40	Field Trial Licenses:	5 @ 15.00		75.0
3304-61-07-40	Taking of Eels	8 @ 25.00		200.0
3304-61-08-40	Quail to Train Dogs			
	Initial:	8 @ 7.50		60.0
	Renewal:	28 @ 5.00		140.0
3304-61-10-40	Commercial Shooting Preserves:	11 @ 50.00		550.0
3304-61-12-40	Mounting Permits:	2 @ 2.00		4.
3304-61-13-40	Special Field Trial Permits:	30 @ 15.00		450.0
3304-64-01-40	Tags and Posters			
	Game Tags:	8952 @ .05	447.60	
	Fish Tags:	3050 @ .02	61.00	
	Posters:	300 @ .05	15.00	523.6
				$11,363.1

COMMONWEALTH OF MASSACHUSETTS
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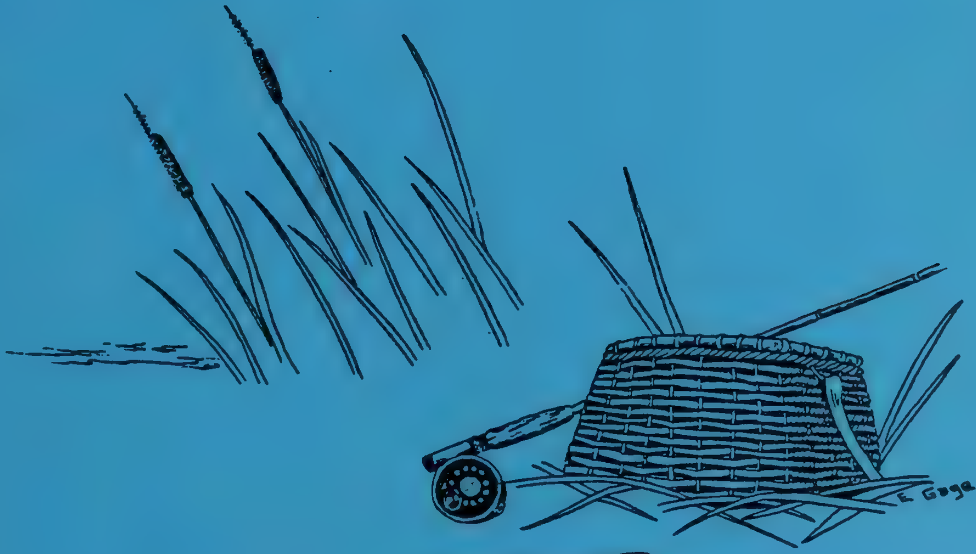
1983 ANNUAL REPORT



Division of Fisheries & Wildlife

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The Commonwealth of Massachusetts
Division of Fisheries and Wildlife
Leverett Saltonstall Building, Government Center
100 Cambridge Street, Boston 02202

DIRECTOR

His Excellency, Michael S. Dukakis, Governor of the Commonwealth, the Executive Council, the General Court, and the Board of the Division of Fisheries and Wildlife.

Sirs:

I have the honor to submit herewith the One Hundred Nineteenth Annual Report of the Division of Fisheries and Wildlife, covering the fiscal year 1 July 1982 to 30 June 1983.

Respectfully submitted,

Richard Cronin

Richard Cronin
Director

Publication No. 13,943-47-150-2-85-CR
Approved by: Daniel Carter, State Purchasing Agent

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THE BOARD REPORTS

George Darey
Chairman

As in the past, the Board has continued its policy of holding its monthly meetings around the Commonwealth in locations selected to facilitate public participation and to allow board members to become familiar with new acquisitions or with sites of special interest. In addition, the Board continued to hold public hearings on issues ranging from routine matters, such as setting waterfowl season dates, to specific changes, such as the public meetings on changes proposed for deer hunting regulations or for trapping procedures.

Personnel

The Board noted with deep sorrow the passing of long time Board member Kenneth Burns on July 29, 1982. Burns had served the Board for 12 years. During the following months, Ray Whitaker of Winchendon was appointed Board representative from the Central Wildlife District to fill Burns' unexpired term. The Board notes also the passing on August 26, 1982 of former Board member Harry Darling. Staff during this period remained relatively stable marked only by routine appointments, promotions and retirements. One change of special note however, came with the departure of Assistant Director of Wildlife Research, Chet McCord, who left the wildlife profession to enter the ministry. His position is, at the present time, unfilled.

Specific Actions

The Board reviewed the status of furbearers in the Commonwealth and, as a result, voted changes in trapping dates and regulations. After two years of zoning, it was noted that there is now a surplus of beaver in the western zone. It was further noted that zoning is no longer necessary so it was voted that the season be opened statewide beginning November 23. Trap sizes and sets too were considered and changes made as recorded in the minutes.

After extensive consideration during both 1982 and 1983, the Board initiated changes in bear hunting regulations establishing a split season with hunting permitted for one week beginning the last Monday of September (dogs permitted) and another week beginning the third Monday in November (dogs prohibited). Hunting hours were established as ½ hour before sunrise to ½ hour after sunset to accord with other hunting hours. Weapons were limited to rifles .23 caliber or larger, bows and arrows as used in the archery deer season, muzzleloaders, .44-.775 caliber, and pistols (see regulations) .357 magnum during the first of the two weeks. Pack size was limited to six dogs with replacement of no more than two per day and no relaying. The use of radio telemetry equipment in hunting bears was prohibited and telemetry on dogs was limited to training periods.

Following the Division's proposal, extensive study by the Board and a prolonged period of public input marked by a series of informational meetings, changes were made in the deer hunting regulations. Ecologically based zones were adopted to replace counties as the basic unit of deer management. Zones will be accepted in 1982-83 and deer management will be shifted to the zones for the 1983 deer season. The shotgun season was lengthened to nine days throughout most of the state. It remained at six, however, on the Cape and the Islands. A two deer limit (only one of which may be antlerless) was established statewide, again excepting the Cape and the Islands. Archery hunting regulations were amended to permit bowhunters to possess a shotgun in their vehicle and a provision was passed permitting handicapped bowhunters to utilize a mechanical bow release. While changes in the dates of the primitive firearms season were rejected, the Board authorized the Director to permit the use of rifled barrel flintlocks but not caplocks during the primitive firearms season.

Numerous changes were effected in fisheries regulations stemming from presentations and public hearings held during the previous year. These included establishment of an open season on Atlantic salmon year' round, establishment of an 18" size limit on brown trout or landlocked salmon taken from Quabbin Reservoir, and a two brown trout limit on all lakes and ponds. Twenty streams were added to this list of waters where the limit is six trout per day. Snagging of fish was prohibited. Special regulations in effect at Lout Pond, Plymouth and Windsor Reservoir, Dalton were eliminated and a new catch and release area, operational from July 1 through Labor Day, to be established on the Deerfield River.

After many years of groundwork, transfer was completed on lands of the former Gardner State Hospital. A tract of 1,600 acres was transferred from the Department of Mental Health to the Division of Fisheries and Wildlife. This area, to be known as the High Ridge Wildlife Management Area, offers outstanding opportunities for hunting, fishing and wildlife observation. As it is easily accessible from a number of populous areas, the Board anticipates that the tract will meet a wide variety of needs and interests. A regional office of Law Enforcement was authorized to use a surplus building by the Fisheries and Wildlife agency. The presence of this office will help control the area use.

Other Concerns

On a number of occasions, the Board has considered introduction of the white amur, a sterile hybrid fish, much touted for its role in weed control and seen as a possible alternative to environmentally questionable chemical agents. Mindful of the hazards of ill-considered introductions, the Board has adopted a cautious stance toward this proposal requesting the most thorough review of information regarding status of the amur in other areas and experiences with the amur which might be relevant to the Commonwealth. Although a number of requests have been received from areas which would like to be considered as experimental sites for such introduction, the Board has not taken action on the proposal at this time because of the complications which could result from such introductions.

Finances are always a matter of concern and the Board notes with pleasure the healthy state of the Division's finances which have survived the crisis of the previous year. Programs have remained intact and license sales appear solid despite a fee increase in March, 1982 and a succession of bad weekend weather during the spring of 1983, which is a key time for fishing license sales. Settlement of a long process of union contract negotiations resulted in considerable salary increases for many Division staff members. As a result, agency employees have gone from the lowest paid, as noted in a national survey of fish and wildlife employees, to a slightly higher than median position, thus, meeting a long-term goal for the Fisheries and Wildlife Board of highest priority.

Planning within the Division continues to move forward both in development of a policy document and in creation of a strategic and operational plan. The Board has partially reviewed the policy document and will continue this process as needed and looks forward to reviewing the planning documents at a later date.

The Board again reviewed the status of Massachusetts Wildlife which has, for financial reasons, been reduced to a single issue per year. Although groundwork has been prepared for subscription fees to be handled by a private non-profit conservation group and inquiries have been made of legislators regarding the possibility of establishing a fund or account to process subscription income, no action has been taken on this to date because of the complications involved.

This year, again, the Board worked hard to obtain passage of a nongame checkoff provision. The bill, passed during the last fiscal year, was vetoed in the last moment. While the program is still far from reality, the latest version of the bill has been accepted by participating groups, passed by the legislature and prospects for its being signed into law are promising.

PLANNING

Kristine L. Corey
Junior Planner

The Division's comprehensive planning effort focussed on the completion of a strategic plan draft for public review and input. Several additional species plans were completed and incorporated, as well as comments received from an earlier in-house review. This draft plan encompasses all areas of agency responsibility and, once approved, will become the basis for future work plans.

Planning was the central theme for an all day employees conference held in March at the Marlboro Fish and Game Association. Attendees were informed by section chiefs of agency progress and plans in preparation for their involvement in the development of work plans.

The annual meeting of northeast regional federal aid administrators focussedon fish and wildlife planning efforts in the northeast. Massachusetts, along with Maryland and Pennsylvania, was invited to present the scope, status, problems and benefits of its planning program to those states in attendance.

FISHERIES

Peter H. Oatis
Assistant Director of Fisheries

Anadromous Fish Management

Merrimack River

The Essex Fishway in Lawrence became operational in the fall of 1982. Sixteen Atlantic salmon were recovered and sent to the U. S. Fish and Wildlife Service in Nashua, New Hampshire. Interpretation of growth patterns on scales indicate that 25% of the run came from upriver releases of salmon fry.

Although the fishway had some serious mechanical problems during the spring of 1983, it did successfully pass 5,508 shad, 4,797 herring, 2,835 lamprey, 91 salmon and 50 striped bass. These fish, with the exception of the salmon, were provided access to the twelve miles of river between Lowell and Lawrence. Salmon were removed to the hatchery. Also, an additional 2,000 adult shad were transported from the Connecticut River to the upper Merrimack in an attempt to hasten the development of shad resources.

Plans were approved for a fishway to be constructed at the Pawtucket Dam in Lowell by 1985.

Jurisdictional problems arising between inland and marine fisheries relating to differences in regulations pertaining to the taking of salmon remain to be resolved.

Connecticut River

The Connecticut River Atlantic Salmon Compact legislation was finally ratified by Congress. The compact allows citizen input on the development of salmon fishing regulations on the main stem of the Connecticut River. Anadromous fish passage at Holyoke totalled 530,000 shad, 450,000 herring, 29,000 lamprey, 346 striped bass and 25 Atlantic salmon.

Fish passage at Turners Falls was greatly improved due to modification of the pools at the Cabot Station. An estimated 12,705 shad successfully used the passage. This represents a significant increase over the 11 shad, which negotiated the passage, in 1982.

A total of 375,000 salmon smolts were released and are expected to return as adults in the spring of 1985. Strategic and operational plans for salmon restoration were completed and approved by the Policy Committee for Anadromous Fish Management of the Connecticut River.

Hydrodevelopment in the upper basin continues to remain a concern especially in the tributaries capable of supporting natural production of salmon.

Fisheries Survey and Inventory

These studies provide base line data essential to managing and assessing inland fish resources and the impact of various environmental or sport fishing factors on natural or stocked fish populations. During the year, biological crews surveyed 113 stations on 80 streams bringing the total number of streams recently surveyed to 471 between 1979-1982. Seventy percent of these streams receive hatchery trout and 63% were found to support wild trout populations. Collections in the Millers River Watershed when compared with similiar surveys done in 1957 and 1968 demonstrated significant changes in pH and loss of certain species known to be sensitive to acidity.

Part I of the Massachusetts Stream Classification Program - Inventory of Rivers and Streams (completed in conjunction with the Division of Water Pollution Control) was completed and published in July.

The Division maintained its annual creel survey of Quabbin Reservoir and continued investigations pertinent to smelt abundance. An estimated 55,158 anglers spent 362,438 hours fishing the Quabbin to catch over 45,000 fish. Major species harvested included lake trout and smallmouth bass. To augment future salmonid supplies, 17,300 landlocked salmon yearlings were released in May. These fish are expected to reach the legal 18 inch minimum length late in the summer of 1984.

Fisheries crews also evaluated fish populations at 35 lakes and ponds throughout the Commonwealth. Recommendations stemming from these surveys provided the basis for introducing smelt and landlocked alewife populations into Lake Mattawa, Lake Chauncy, Five Mile Pond, Little Alum and Lake Lorraine. They also provide the data necessary for evaluating the recent imposition of the 12 inch minimum length limit on bass.

Introductions

The introduction of tiger muskie yearlings predicated upon data stemming from these investigations was greatly curtailed as a result of the deliberate posioning of young muskies in the hatchery by vandals. The surviving muskies were released in the A-1 Site, Westboro, Lake Quannapowitt, Wakefield, and Santuit Pond, Mashpee. In an effort to augment the diversity of game fish available within the state, a limited stocking (34,000 fingerling walleye) were released in Assawompsett Pond, Lakeville. It is hoped that these fish will support some limited recreation but more importantly serve as a brood supply of a desirable strain of walleye that may be introduced to other selected water access in the state during the next ten years.

Technical Assistance

Fisheries biologists and managers responded to numerous requests for technical assistance from other governmental and private agencies. Such requests cover the gamut of subjects ranging from assessing potential impacts of developing hydropower, evaluating various wetland alteration permits, collecting fish for toxic waste analysis and participating on numerous environmental and regulating committees.

On the development side, Division personnel initiated the installation of stream improvement devices, the catch and release area of the Swift River in Belchertown, repaired roadways along the Squannacook River and limed three ponds: Big Sandy Pond, College Pond and Fresh Pond all in Plymouth. The purpose of liming these waters is to counter the potentially harmful effects associated with the increasing acidification of these waters.

Considerable time, effort and money will have to be expended in the coming years as the impact of chronic release of sulphates and nitrates; the fundamental material for acid rain, continues to be a major source of unchecked pollution.

Urban Angler

Volunteer efforts, channeled through the Urban Angler Program, resulted in the certification of 75 fishing instructors. Eight fishing clinics were conducted exposing about 240 noice anglers to the art of fishing. Special assistance was also provided to the state of New Hampshire in helping them to set up a similiar urban fisheries program. Work with law enforcement officials culminated in a series of papers and regulation abstracts printed in Laotians and Himory. The Urban Angler Coordinater attended numerous sportsmen's and social events for the purpose of demonstrating fish cooking and preparation.

The Urban Angler Coordinator presented the Massachusetts Urban Angler approach and program at the National Urban Angling Symposium in Grand Rapids, Michigan.

The sea-run brown trout program continued to receive the support and interest of its dedicated followers. Unfortunately, disease still ranks as a major problem with the culture of young smolts. Until this problem is resolved, there will be no expansion of this potentially great fishery.

HATCHERIES

David Fredenburgh
Chief Fish Culturist

During fiscal 1983, the hatcheries produced 1,490,800 fish weighing 508,950 lbs. Of that number, 1,164,700 were catchable size.

Through authorization of a bond issued to the Division of Water Pollution Control, this Division received funding to construct the pollution control project at the McLaughlin Hatchery. The appropriation is 750,000 dollars and should be sufficient to do the final engineering work and actual construction. This is a project that has been in the works for over ten years. Hopefully construction will begin within the year.

The tiger muskie program suffered a severe set back when vandals threw poison into the tanks killing over 11,000 fish. Only one tank escaped untouched leaving about 4,000 living fish.

As expected, the Atlantic Salmon run was reduced in numbers from the previous year. Only 11 adult salmon were held at the hatchery resulting in the spawning of 35,000 eggs. The hatchery is also involved with raising Landlocked Salmon for stocking the Quabbin Reservoir.

A new gravel-pack well was constructed at the Sandwich Hatchery. This will be used as backup for the main well that has been in continuous use for over 20 years. The Division has been involved with a local developer who plans to build a condominium project adjacent to the hatchery. Attention was given to the potential ground water pollution and surface runoff as it might affect the hatchery. The State Attorney General's Office, as well as the Department of Environmental Quality Engineering, assisted in developing a plan that the developer must follow as to minimize the effects of construction on the hatchery. Normal maintenance projects were carried out at all the other hatcheries with no major construction activity.

	2-4"	6-9"	9-12"	12+	Weight	Total Fish
McLaughlin						
Rainbow	105,640	75,844 (T)	226,142	18,187	181,983	425,813
Brook	136,000 (T)	193,582 (T)	51,470	1,440	62,101	372,492
Brown	64,900 (T)	195,488			57,813	260,388
Salmon (Land.)	15,960	-	-	-	1,285	15,960
Totals	322,500	454,914	277,612	19,627	303,182	1,074,653
Montague						
Rainbow	-	-	43,450	-	40,553	43,450
Brook	-	-	19,850	-	14,973	19,850
Brown	-	-	13,100	-	10,418	13,100
Totals	-	-	76,400	-	65,944	76,400
Sunderland						
Rainbow	-	-	16,788	-	17,162	16,788
Brook	-	15,100	22,707	-	27,502	37,807
Brown	-	17,750	15,695	-	21,856	33,445
Totals	-	32,850	55,190	-	66,520	88,040
Palmer						
Rainbow	-	-	-	-	-	-
Brook	-	-	-	2,409	4,291	2,409
Brown	-	-	-	345	434	345
Salmon (Atl.)	3,640	22,500	-	-	1,121	26,140
Salmon (Land.)	-	17,300	-	-	3,021	17,300
Muskie (Tiger)	-	3,200	-	-	178	3,200
Totals	3,640	43,000	-	2,754	9,045	49,394
Sandwich						
Rainbow	-	36,350	61,490	-	36,234	97,840
Brook	-	14,500	11,435	-	11,158	25,935
Brown	-	74,266	4,300	-	16,859	78,566
Totals	-	125,116	77,225	-	64,251	202,341
Grand Totals -	164,140	616,880	486,427	22,381	508,942	1,425,828
	+ 162,000	39,000 (T)				+ 65,000 (T)
	326,140	655,880				1,490,828

WILDLIFE

Wayne F. MacCallum
Assistant Director for Wildlife

The Wildlife Research Section consists of one chief, three game biologists, two assistant game biologists, one restoration project field agent, and one conservation helper. This staff is responsible for research on and management of approximately 75 species of mammals, birds, reptiles, and amphibians which are traditionally hunted, trapped or otherwise taken for food, animal products, or sport. Additionally, the section is responsible for administering the Division's falconry program, for coordinating development of the Division's wildlife management areas, and for recommending to and advising the senior staff and Fisheries and Wildlife Board on matters of administration, regulation, and policy relative to the Commonwealth's wildlife resources. The section oversees three Federal Aid in Wildlife Restoration Projects (W-9-D, W-35-R, and W-42-R) comprising about 35 research jobs in addition to abour four other jobs conducted by the Massachusetts Cooperative Wildlife Research Unit and supervised by the Division. Section biologists also coordinate with the Realty, Planning and NonGame Sections when particular expertise on wildlife matters is needed. Summaries of current studies underway follow.

WATERFOWL

Pre-season Banding

A total of 905 birds were banded during the 1982 pre-season banding segment; 404 wood ducks, 255 mallards, 90 black ducks, 6 mallard x black hybrids, 74 bluewinged teal, 67 greenwinged teal, 2 pintail and 1 hooded merganser.

Waterfowl Inventory Flight

A total of 106,176 waterfowl were counted during the January 1983 winter inventory, the lowest count in 10 years. Black ducks (16,843) were 27% below last years count and 19% below the 10 year average. Most species of waterfowl were down from last year except buffleheads and Canada geese.

Winter Banding Program

Unseasonably mild weather resulted in the poorest black duck trapping season on record - only 34 black ducks, 2 mallard x black hybrids, 22 mallard and 19 pintails were banded. Thirty-six ducks were sampled for D.V.E. as part of a flywaywide monitoring program.

Wood Duck Nest Structure Study

Plastic wood duck nest structures were created by modifying gray, 5 gallon plastic buckets with an entrance hole, wooden lid and drainage holes. These buckets were put up on angle irons, nailed to poles or mounted on top of stumps and equipped with wooden tunnel predator guards, plastic trash can lid predator shields, or aluminum downspout predator guards. Wooden boxes were of standard type. In addition, some areas had horrizontal stove pipe nest structures used in a previous starling deterrent study.

No duck nests were started in either boxes or plastic buckets on 13 new areas established the winter of 1981-82. Usage on 14 established wood duck box areas ran 22% for 45 buckets, 45% for 179 boxes and 33% for 12 cylinders. Boxes and cylinders were benefited by having previously been used by hens in past years.

Biological Tagging of Wood Ducks

This is an experimental technique developed at the Univeristy of Florida which allows northern hatched wood ducks to be identified by their blood parasite loads. It is necessary to establish baseline data for infection rate. To this end, Massachusetts-collected blood smears were read, and training sessions were held for a Maine Fish and Game Department Technician and two Worcester State College students.

Park Waterfowl Project

A total of 12,899 mallards, 1,672 black ducks, 1,976 Canada geese, 124 coot along with 25 wigeon, 15 wood ducks, 17 pintails and 4 green-winged teal were counted at 140 locations in 81 communities across Massachusetts during the 13-24 January survey period. The 1983 mallard count was 3.6% higher than the previous 1978 count while the black duck count was down 1.0%.

Experimental Waterfowl Season Appraisal

Massachusetts waterfowl harvest in 1982-83 declined 14% from the previous year, similar to a flyway decline but well below 3 other New England states. The state zoning experiment was changed to divide the inland zone into a western and central portion, each with independent seasons.

TURKEY RESTORATION

The fourth Massachusetts spring gobbler hunt was held during a two-week period in May 1983 in Berkshire County and parts of Franklin and Hampden counties. A total of 3,016 permits were allotted, with 184 turkeys taken. The participation rate was 89.5% (2,685) and the hunter success rate was 6.8%. Berkshire County yielded 156 turkeys, Franklin County 16, and Hampden County 12. Adult turkeys weighed 13.0 - 21.9 pounds gutted and immatures 10.3 - 17.0 pounds gutted. Adult males comprised 100 (54.3%) of the total kill. It is recommended that the entire area west of the Connecticut River be opened to turkey hunting in 1984.

Eighty-five turkeys (55F, 30M) were captured and processed during winter trapping, for a mean capture rate of 2.60 turkeys per trap-hour and a mean success rate of 84.4%. Sixteen birds (12F, 4M) were released on West Brookfield State Forest; 17 (13F, 4M) in the Miller's River Wildlife Management Area, and 25 (18F, 7M) in Dudley, Worcester County. Eleven toms were legbanded and released at the capture site and 16 additional birds (12F, 4M) were instrumented for study under Unit Job IV-4.

MOURNING DOVE

The total number of calling doves on three long-term standardized routes decreased 45% during 1982-83. Counts on all 18 comparable routes decreased 22% (226 to 175) from 1982 to 1983.

WOODCOCK

As a result of 33% decrease in the 1982 Woodcock Singing Ground Census, the Division of Fisheries and Wildlife Board elected to decrease the daily bag limit on woodcock from 5 birds to 2 birds during the 1982 woodcock season. The reason for the dramatic decrease in birds was a major snowfall in April. Harvest during the 1982 season was subsequently reduced by 37%.

Unfortunately, two April snowstorms struck again in 1983. Woodcock censuses were run on 12 randomized singing ground survey routes between 28 April and 12 May. Counts showed that the number of woodcock heard per route had decreased to 1.31 birds; the lowest ever recorded in Massachusetts. The Division again recommended to the Fisheries and Wildlife Board that a 2 woodcock per day bag limit be imposed for the fall of 1983 hunting season.

FALCONRY

For Fiscal Year 1983, the ranks of the falconers remained stable with 16 apprentice, 11 general and 6 master falconers permits issued. The more popular bird was again the redtailed hawk. Two breeding and nine salvage permits were also issued.

BEAVER

The 1982-83 beaver season was changed to run from 23 November to 28 February statewide. During this season, a total of 584 beaver were taken by 77 trappers in 83 towns. This take represented a decrease of only 10 beaver (1.7%) from 1981-82. Changes were most evident in Franklin (harvest down) and Hampshire counties in the western zone and Essex and Middlesex counties in the eastern zone (harvest up). Kit beaver approximated slightly more than one-third of the harvest, approaching levels similar to that prior to the record harvest of 1979-80. Average pelt prices were the lowest recorded since 1970-71.

OTTER AND FISHER

The 1982-83 otter season was revised to run from 23 November to the last day of February, statewide. The 1982 fisher season (as in 1981) extended through the month of November. During these seasons, 47 successful trappers took a total of 106 otter in 60 towns for a mean take of 2.3 otter per successful trapper. This compares with a take of 90 and a mean take of 1.7 in 1981-82.

The fisher take increased from 116 in 1981 to 140 in 1982, with 64 successful trappers taking a mean of 2.2 fisher each among 58 towns (54 trappers, mean of 2.1 in 1981).

Worcester (32), Berkshire (16), and Franklin (14) counties yielded the most otter, with Worcester (73), Franklin (31), and Essex (26) the most fisher. Nine preliminary aquatic furbearer zones were developed with zone 02 (30) the highest in otter take.

A total of 28 otter and 136 fisher carcasses were received from cooperating trappers. The mean age of otter in 1982-83 was 1.97 and of fisher 1.56. This compares with 1.88 for otter and 1.41 for fisher in 1980-81. All (5, 100%) of the otter aged 2.5 and above and 15 (71.4%) of the fisher aged 1.5 and above taken during 1982-83 had been bred. This compares with figures of 100% for otter and 68.2% for fisher in 1981-82. Average corpora lutea counts were 2.4 and 2.9 for otter and fisher, respectively, in 1982-83 and 3.0 and 2.5, respectively, in 1981-82.

BOBCAT

A total of 37 bobcats were taken in 1982-83, including 18 by hunting, 14 by trapping, and five road kills. The mean take per hunter was 1.1 and per trapper 1.2. Bobcats were trapped predominantly in November (71.4%) and hunted in January (55.6%). Bobcats are low in trapper selectivity (7.1%) and moderately high (55.5%) in hunter selectivity. In 1982-83, bobcats were taken in 27 towns in five counties. Immature bobcats (0.5 age class) comprised 38.2% of the take.

COYOTE

A total of 31 coyotes were taken by 24 sportsmen in 22 towns and six counties during the 1982-83 hunting season. Two-thirds of the kill was in November, with nearly one-half (48%) taken by hunters targeting for coyote. Pups comprised 54% of the harvest, as compared to 80% in 1981-82. Eight non-hunting mortalities were recorded.

FURBUYER HARVEST TALLIES

A total of 29 furbuyers submitted annual reports, of these, 11 did not buy any furst from Massachusetts trappers or hunters. The remaining 18 purchased 25,482 muskrat, 810 mink, 105 otter, 46 skunk, 11,657 raccoon, 81 fisher, 820 red fox, 336 grey fox, 628 beaver, 27 bobcat, 35 coyote, 165 oppossum, and 22 weasels.

The results of four fur auctions held by the Bay State Trappers Association were weighed and tabulated to give a yearly average. The average prices for 1982-83 were muskrat $3.51, mink $17.64, otter $27.06, skunk $.60, raccoon $5.36, fisher $95.97, red fox $34.87, grey fox $32.64, beaver $11.43, bobcat $75.27, coyote $22.80, oppossum $.80.

BLACK BEAR

Several changes in the bear hunting regulations were made in 1982- including extending the season to two weeks, prohibiting radiotelemetry devices, and restricting use and pack size of hunting hounds. A total of 823 bear hunting permit applications were received in 1982 and 13 bears were taken, all during the first week of the season. This was the greatest kill on record. Nine males and four females were taken from Berkshire (1), Hampden (1), Franklin (5) and Hampshire (6) counties. Ten non-hunting mortalities were tallied, including seven road kills, one illegal kill, one nuisance kill, and one capture mortality. Eleven nuisance complaints, including seven beehive depredations, were recieved.

DEER

The 1982 statewide deer harvest for all seasons combined was 4,002 deer, which is a decrease of 1,009 over the 1981 harvest of 5,011. Seventy-six (76%) of the deer harvest was reported in the four western counties of Berkshire, Franklin, Hampshire and Hampden. Worcester County contributed 11% (435 deer) of the total harvest and Barnstable County 2% (99). The islands of Dukes and Nantucket counties, contributed 2% (80 deer) and 3% (136 deer) of the total. Management Zones I and II combined contributed 4% (175 deer) to the overall total. Hunters' bag limit was changed to two (2) deer, - one of which could be an antlerless deer.

A total of 3,265 deer was taken during the December shotgun-only season, including 2,210 antlered males and 1,055 antlerless deer. Archers took 446 deer (264 bucks, 182 does) and primitive firearm hunters bagged 282

(116 bucks, 166 does). Paraplegic sportsmen harvested 9 (5 bucks, 4 does) during their special season.

Successful hunters taking an antlered male during any season were allowed to hunt and take a second deer - but during the shotgun season only, a hunter must have been issued an antlerless permit to harvest an antlerless deer.

A total of 46,392 applications were received for an allotment of antlerless deer permits for the 14 deer management zones and 475 additional farmer-landowner permits were issued.

Natural Resource Officers reported a total of 680 non-hunting deer mortalities during calendar year 1982. Road kills (436, 64%) were the most prevalent source of mortality, followed by illegal kills (48, 7%), dogs (118, 17%), and miscellaneous causes (78, 12%).

STUDIES CONDUCTED UNDER CONTRACT WITH THE MASSACHUSETTS COOPERATIVE WILDLIFE RESEARCH UNIT

In July 1982, a contract (renewable annually) was instituted with the Massachusetts Cooperative Wildlife Research Unit at the University of Massachusetts, to conduct studies under the Federal Aid in Wildlife Restoration Act applicable to the needs and interests of the Division. Studies on black bear and raccoon, formerly funded under a smaller Division grant, were transferred to contract funding. Two new contract studies, on bobcat and wild turkey, were instituted in the fall of 1982.

1. Black Bear Home Range, Movements, and Habitat Use in Massachusetts

Intensive monitoring efforts ended in July 1982. Location data from 29 bears (9 males - 20 females) were analyzed with the aid of the "Telem" program compiles 1:24000 map overlays showing time, date, and locations in desired time-date intervals for each bear. Overlays were used in conjunction with a detailed habitat map of the main study area (about 300 sq. km.). Preferred and important seasonal habitats were identified to determine effects of habitat on home range size, range quality and bear densities. Collars were changed on all denned bears during February and March 1983. Three new bears were instrumented in August 1982 and one yearling male recaptured. Three more new bears were instrumented in June 1983 and one male and one female recaptured.

The next phase of the bear study will be preparation of the final report of home range, movements, and habitat use, followed by initiation of a new job on bear reproduction and sow-cub behavioral interactions.

2. Population Dynamics, Home Range, and Movements of Raccoons in Western Massachusetts

The final report on this job was completed by PhD candidate Glenn Olson. An abstract is presented below.

The value of raccoon pelts in Massachusetts has increased from $1,447 in 1964 to $558,840 in 1981, while harvest has increased from 965 to 23,000. During 1980 and 1981, 496 raccoons were collected. A sex ratio of 52.1% males and 47.9% females were found with 47.9% juveniles in the sample. Mean number of placental scars per breeding female was 3.60 (N=62), with 29.0% of females having placental scars. Juvenile females comprised 50.4% and 84.6% of yearling females failed to breed. A positive correlation (p 0.05) was found between female body weight and number of placental scars. Body weight and length varied (p 0.05) with area of the state from which raccoons were harvested. During the two seasons, an additional 2,649 pelts were examined and a correlation between pelt length and age/sex categories (p 0.01) was discovered. Raccoons from exploited and unexploited areas were intensively monitored in western Massachusetts. Juvenile yearlings comprised 60.7% of exploited population and only 25.0% of unexploited populations. Mean age of the exploited population (1.82 years) was significantly lower than the unexploited population (3.52 years). Both populations selected against heavily wooded areas. Activity patterns were similar in each area with onset of activity at 1900 hr., a lull at 0000 hr. and activity ceasing at 0700 hr. Population density was lower in the exploited area, while mean number of placental scars per adult female was higher. Raccoons visited 90% of their home ranges within 20 days of radio-tracking. Exploited adult female home ranges were significantly larger than unexploited adult males. Management recommendations included continuing to monitor harvest, sex and age ratios, and establish guidelines for future management decisions.

3. Ecology and Status of the Bobcat in Western Massachusetts

Trapping started in December 1982 and continued through March 1983. Nine bobcats (5 males - 4 females) captured 33 times in box traps, were weighed, measured, and collared with radio-transmitters. Movement, activity, and habitat data are presently being obtained. One female apparently had kittnes in May and lost her transmitter in June; retrapping efforts were unsuccessful.

Snow-tracking data were obtained from 12 days of tracking 6 collared bobcats (3 males - 3 females). Snow-tracking observations have been made to evaluate habitat use, feeding habits, behavior, and intraspecific interactions.

Thirty-two harvested bobcat carcasses were obtained from the Massachusetts Division of Fisheries and Wildlife. Sex, age and female reproductive status were determined from the carcasses, along with weight and length measurements. The digestive tract contents were removed for food habits analysis.

4. Wild Turkey Population Dynamics

Trapping efforts in January and February 1983 provided 16 birds (4 males, 12 females) for the study. All instrumented birds were monitored through the winter to obtain data on habitat use and survival. Monitoring efforts during and following spring dispersal concentrated on hens in order to detect onset of nesting behavior. All hens will be monitored through the breeding season to provide information on productivity. Hens with broods will be monitored through the summer to obtain data on brood habitat use.

Three hens died during the winter monitoring period; 2 were lost to predation and 1 may have been illegally killed. Three hens were also lost during the breeding season in what appears to be similar cases of harness breakage.

WILDLIFE SPECIES FILES

The final report for this study was completed, covering the two systems described below.

A manual filing system consolidating information on classification, distribution, harvests and trends, literature and life history on the vertebrate wildlife of Massachusetts was developed. Files were established on 86 game, unprotected and falconry birds and mammals; 79 "species for special consideration"; and four other species. These files are updated periodically.

An interactive computer program was developed to generate distributional information on the wildlife of Massachusetts. Data can be generated either by location or by species. About 12,100 line entries pertaining to mammals have been coded, of which about 6.8% has been computerized. Additional coding and entries pertaining to mammals have been coded, of which about 6.8% has been computerized. Additional coding and entries will be made periodically. A User's Manual for this program was developed.

MAST SURVEY

District offices surveyed their oak plots in August to determine acorn production. There were 89 permanent oak plots across the state consisting of 39 white oak plots (374 trees) and 50 red oak plots (488 trees). These plots were all surveyed during August to determine acorn production. In addition, a subjective mast report was distributed to interested volunteers throughout the state, to collect general data on a wide variety of wildlife food crops.

White oak production was again nearly a complete failure all across the state except for Central District which attained a poor rating. Red oak production was also very low, with failure everywhere except Southeast and Western Districts which achieved poor ratings. Cherry, white ash, dogwood, blackberry and raspberries seemed to produce well while production from other soft mast species was relatively low.

STATEWIDE WILDLIFE DEVELOPMENT (W-9-D PROJECT)

The "9-D" Project is concerned with the operation of our wildlife management areas.

This includes all public access work such as roads, trails, parking lots and signs, as well as actual wildlife habitat work such as field management, forest management and planting. The project has an additional function in that it is responsible for the erection and maintenance of nesting structures, i.e., wood duck boxes, loon nesting rafts on Quabbin Reservoir, and osprey nesting platforms.

Below is a summary of work done between 1 July 1982 and 30 June 1983:

1. Buildings: Maintained 17 buildings on 10 areas.
2. Dams: Maintained 3 water control structures on 3 areas.
3. Bridges: Maintained 1 vehicular bridge and 2 foot bridges on 2 areas.
4. Roads and Trails: One-half mile of trail was developed on one area, 47.5 miles of roads were maintained on 6 areas, and 32.7 miles of trails were maintained on 14 areas.
5. Fences: A fence of 0.9 miles was erected on one area and 7.6 miles were maintained on the same area.
6. Parking Lots: Three lots were constructed on one area and 53 lots were maintained on 13 areas.
7. Waterfowl Blinds: A total of 15 waterfowl blinds were maintained on 2 areas.
8. Signs: One hundred sixty-four signs were erected on 6 areas and 8.5 miles of boundaries were posted on 4 areas.

   In addition, 1,262 signs on 29 areas were maintained and 60.5 miles of boundaries were checked and reposted on 27 areas.
9. Tree and Shrub Planting: On 4 areas, a total of 1,100 shrubs and 100 trees were planted.
10. Vegetation Control: Brush was controlled on 296 acres in 15 wildlife areas.
11. Timber Management: Nine acres was selectively cut on 2 areas.
12. Nesting Structures: One hundred fifty-six wood duck nesting boxes were erected statewide and 940 boxes were maintained. Three osprey nesting platforms were constructed in the Southeast District and 3 loon nesting rafts were placed on Quabbin Reservoir.
13. Herbaceous Seeding: Fields were maintained by planting and fertilizing on 8 areas totalling 291 acres and an additional 1,671 acres of open land on 19 areas were managed by co-operative agreements with local farmers.

14. Clearing: Two acres of a red maple stand was cleared on one area to promote sprout growth.

15. Water Level Management: Water levels were manipulated on one area of 160 acres to encourage growth of emergent vegetation.

16. Managed Public Hunts: Managed public hunts were held on 4 areas (2 for waterfowl, 1 for pheasant, 1 for deer).

17. Gates: Newly constructed gates totalled 16 on 6 areas, and 26 gates were maintained on 8 areas.

18. Fence Removal: Approximately, one-half mile of old fencing was removed from 1 area.

Additional time was spent by the project leader and District personnel in planning work, submitting reports and ordering supplies.

District personnel also spent time repairing and maintaing equipment bought for and used on the project, and time was also used in inspecting ongoing work and checking each area.

GAME FARMS

E. Michael Pollack
Chief Game Biologist

Game farm personnel performed routine maintenance such as pen replacement and construction. Efforts continued to automate the Division's propagation operation. Feed formulas and management techniques were reviewed to update this important program.

Game Farm Production

Fiscal Year 1983

Pheasant

Game Farm	SR	A	B	C	PG	Misc.*	Totals**
Sandwich	50	-	1,008	1,696	4,016	600	6,770
Wilbraham	1,890	-	2,780	4,768	5,140	150	14,728
Ayer	2,435	60	1,504	4,428	8,316	550	16,743
Totals	4,375	60	5,292	10,892	17,472	1,300	38,241

*Miscellaneous - Cocks and hens for field trials, displays, youth hunt, etc. approximate numbers.

**Totals are for cock birds only.

Quail

A total of approximately 2,820 quail, produced at the Sandwich Game Farm, were released on the wildlife management areas in the Southeast Wildlife District. In addition, approixmately 600 quail were distributed for field trial purposes.

White Hare

A total of 800 white hare were purchased from a dealer in New Brunswick, Canada for release in Massachusetts covers.

NON-GAME AND ENDANGERED SPECIES

Bradford G. Blodget
Assistant Director
Nongame and Endangered Species

The Nongame and Endangered Species Program continued operations in Fiscal Year 1983 despite ongoing funding difficulties. Administration cuts in endangered species Federal-aid monies allotted to Massachusetts were mostly offset by alternate Federal-aid arrangements under the Pittman-Robertson Act. The program's basic budget was augmented by the Bald Eagle Trust established in Fiscal Year 1982.

Despite funding shortfalls, Fiscal Year 1983 was a year of significant progress for the program. The program was strengthened by the new ad-hoc Nongame Advisory Committee appointed in Fiscal Year 1982. The Committee took a particularly bold and vigorous lead in solving the program's historic funding problems, supporting legislation that would establish a nongame wildlife check-off on the state income tax form. The same legislation would further strengthen the program by transferring the Massachusetts Natural Heritage Program from the Department of Environmental Management into the Division of Fisheries and Wildlife. Work continued on a number of projects including Bald Eagle Restoration, Plymouth Red-bellied Turtle Studies, and various wildlife inventories. Highlights of the year's operations include:

Nongame Advisory Committee

This seven-man committee met monthly during Fiscal Year 1983 with the Assistant Director and provided guidance and direction on numerous issues. Included in their discussions were (1) review and revision of the Division Policy (2) development of a statement of goals and objectives (3) planning priorities (4) identification of strategies to effect passage of the Nongame Check-Off Legislation (5) program budget including consideration of added staff and (6) general programmatic review. The Committee also discussed promotional techniques to make the income tax check-off successful (if the measure becomes law). Tentative plans were developed for an art contest to develop a program logo. The Eastern Cougar Study, the Impact of Human Visitation to Quabbin Reservation on the Bald Eagle and the Plymouth Red-bellied Turtle Study was discussed at length.

Income Tax Check-off Legislation

The Division continues to press for the check-off as the fairest and most desirable funding scheme for nongame programs at this time. Included in this legislation as written are certain provisions intended to streamline and strengthen the nongame program such as the transfer of the Natural Heritage Program into the Massachusetts Division of Fisheries and Wildlife. This would strengthen the existing Nongame and Endangered Species Program, as functions would be merged and unnecessary duplication eliminated. Management cannot predict the eventual outcome of the legislation, but it appears more likely than ever before that eventual passage will occur. In anticipation of passage, Fiscal Year 1985 draft expenditure plans will be developed based on anticipated revenue of $400,000 in the first year.

Bald Eagle Restoration

Bald Eagle hacking activities continued at Quabbin Reservoir. Two eaglets secured from Michigan were raised on the hack tower, equipped with wing-tags and tail-mounted radio transmitters and released on July 29, 1982. One assumed female flew to Ottawa, Canada shortly after release and was not tracked beyond that point nor seen again as of June 30, 1983. The assumed male continued to frequent the Quabbin area right through the period.

Michigan declined to provide birds for translocation in 1983 due to a serious dip in productivity in that state. Program personnel working in conjunction with the states of New Jersey and Pennsylvania, the Province of Manitoba, the U. S. Fish and Wildlife Service and the Canadian Wildlife Service, developed a complicated arrangement whereby Massachusetts would receive four Manitoba-born eaglets in early July, 1983. This project will continue through 1986.

Bald Eagle Winter Survey

Statewide survey activities on January 8, 1983 revealed 23 bald eagles and three golden eagles. Twenty bald eagles and all the golden eagles were counted in Quabbin Reservation.

Plymouth Red-bellied Turtle

Despite continued netting of turtles and investigation of new leads by Terry Graham, the research contractor, no new populations have been found and the estimated population estimate remains at about 250 animals. Addition of new increments of life history data have slowed and reports indicate that the population is experiencing extremely poor recruitment due in the main to severe predation by skunks and raccoons. Accordingly, a decision was made in Fiscal Year 1983 to begin moving away from basic life history studies in favor of directed management actions.

Nongame Wildlife for Special Consideration in Massachusetts

A second edition of this listing was produced in Fiscal Year 1983 and quickly became dubbed "The Massachusetts Redbook." A comparison listing, Native Plants for Special Consideration in Massachusetts was also produced in conjunction with the Natural Heritage Program.

Great Blue Heronry Inventory

Active nests in the state rose from 124 in 1982 to 191 in 1983. Brood size among all colonies was 2.9 young/nest compared to 2.2 in 1982. Total known production of 489 young was more than double the 240 young counted in 1982.

Tern Inventory and Management

Roseate Tern experienced the most dramatic change in 1983, dropping 24% from 1,986 pairs in 1982 to 1,502 pairs in 1983, the lowest number of pairs recorded since 1978 when 1,322 pairs were recorded. Unfortunately, Monomoy, Chatham has been lost as a secondary colony with only Bird Island remaining as a principal site. In 1983, 93% of the Roseate population were at Bird Island.

The Artic Tern picture continued to deteriorate badly with a fifth straight year of decline from 53 pairs in 1978 to only 18 pairs at five stations in 1983.

On a brighter note, Common Tern numbers rose to 7,909 pairs at 20 stations compared to 7,577 pairs at 22 stations in 1982. Least Tern continued a rising trend reaching their highest level in history at 1,112 pairs. The mainland-nesting Least Terns seems to be a chief beneficiary of management by string-and-stake posting, whereas the larger terns nest mostly on off-shore islands where the benefits are not as dramatic and obvious. Also, the nesting habits of the larger terns seem to place them in direct competition with gulls for limited island nesting space.

Piping Plover Survey

During the 1983 nesting season, data on this coastal-nesting shorebird were collected incidental to tern colony census efforts. Seventy (70) pairs were reported from 33 stations. The world population of Piping Plover may not exceed 1,600 pairs and concern has grown that the species is vanishing in many parts of its range. Few historical records are available. Preliminary information suggests that Massachusetts may harbor one of the largest breeding populations in the United States. This inventory will be expanded in 1984 with more systematic data collection.

Bat Studies

Inspection of western Massachusetts bat hibernacula produced the following tallies of bats present: Bats Den Cove, Egremont - 10 little brown bats, 18 Pipistrelles, 6 Keen's Bats, 1 big brown bat and 3 unidentified Myotids; Chester Emery Mines - 207 little brown bats, 83 Keen's Bats, 25 Pipistrelles, 1 unidentified Myotid. No Indiana Bats an endangered species were discovered at either location. Each year, program biologists examine additional hibernacula; gradually a more complete picture of the status of these mysterious and often misunderstood mammals is emerging.

Breeding Bird Inventory

High Ridge Wildlife Management Area - On May 28, June 2 and 3, a general breeding bird inventory was conducted at High Ridge in Gardner. Eighty species were found including high numbers of bobolinks and chestnut-sided warblers. Program plans call for similiar surveys elsewhere which will enable the Division to keep a record of lists on its management areas and wildlife lands.

Osprey Project

During Fiscal Year 1983, in conjunction with Commonwealth Electric Company, osprey nesting poles were installed at South Cape Beach, Mashpee and the North River Marshes in Marshfield on March 24, 1983 and at Federal Pond in Carver, June 15, 1983. The program supplies technical guidance in site selection and Commonwealth Electric Company provides hardware, manpower and equipment at a cost of about $600/installation.

The Osprey Project is clearly beginning to bear fruit. A record number of ospreys (60 pairs) nested in Massachusetts during 1983 and produced a record number of young (123), a figure nearly double the young fledged in 1982.

DISTRICTS REPORTS

Northeast District, Walter L. Hoyt, District Wildlife Manager
Southeast District, Louis Hambly, District Wildlife Manager
Central District, G. Christopher Thurlow, District Wildlife Manager
Connecticut Valley District, Herman Covey, District Wildlife Manager
Western District, Tom Keefe, District Wildlife Manager

The five wildlife districts are the field units of the Division of Fisheries and Wildlife working directly on Division properties, conducting field research under the supervision of project biologists and serving as liaison with sports, conservation groups and the general public. During the 1983 fiscal year, personnel from all districts stocked trout, pheasants, and varying hare and operated checking stations at which hunters checked in deer, turkeys and where trappers checked in their pelts. They assisted the Department of Law Enforcement in enforcing wildlife regulations and monitored controlled hunts at the Delaney Wildlife Management Area (Northeast), Otis Air Force Base (Southeast) and Ludlow Wildlife Management Area (Connecticut Valley).

District staff members also took part in on-going research projects such as waterfowl inventory and the mid-winter eagle survey. They conducted mourning dove and woodcock censuses, and took part in a statewide mast crop survey. Staff members of the Connecticut Valley District also became involved in work on the black bear research project being conducted through the University of Massachusetts, while members of the Western District staff worked closely with research personnel from Westboro and from the University on the wild turkey program. In this context, they scouted birds, made and maintained contact with landowners and assisted in trapping birds to be moved to other portions of the Commonwealth. Field crews assisted the wood duck research program by putting up, cleaning and maintaining wood duck nesting boxes as needed and the Southeast District staff did the same with houses for purple martins.

As in the past, District personnel responded to public inquiries, picked up injured animals and fielded complaints about nuisance animals by providing advice, loaning traps and where necessary, by moving beaver. During this year, the District staff members also took on additional activities as the Nongame and Endangered Species Program gathered momentum. Staff members from the Central and Connecticut Valley Districts assisted in the eagle restoration project at Quabbin, staff of the Western Wildlife District became involved in the statewide survey of heron rookeries, staff of the Northeast District surveyed sanctuaries for unusual plants and animals and confirmed the presence of the rare silverling on the Carr Island Sanctuary, Salisbury. Staffers from all districts participated in the statewide survey of breeding salamanders.

Fisheries staff members of all districts were heavily involved in conducting investigations into the water chemistry of selected ponds and streams to determine species composition of fish populations, growth rates and productivity of the waters. Special emphasis was placed on monitoring the pH of these waters as concern increased over the accelerating acidification of ponds in the Commonwealth. The only mitigation measure practiced was liming which was undertaken on Laurel Lake, Lee; Comet Pond in Hubbardston; and eight ponds in the Southeast District.

The fisheries staff participated in fisheries surveys as needed and in projects specialized to their area. This brought staff from the Northeast District to the Essex Dam where they assisted in monitoring and operating the new fish lift. Staff of the Connecticut Valley District prepared special cages for trout which they used to monitor trout survival prior to stocking the Millers River for the first time in 20+ years while staff of the Southeast District assisted in efforts to improve the Mattapoisett River for the sea-run brown trout fishery.

Time not spent in the above mentioned activities was spent in technical review of a wide assortment of projects deemed to have a possible impact on fisheries or wildlife and in maintenance of vehicles, facilities and wildlife management areas. This activity which forms a large portion of the responsibilities of the Districts, involved maintenance of roadways and parking areas, posting of boundaries, cutting, brushing, mowing and planting. In both the Connecticut Valley and Central Districts some of the lumber cut for removal was subsequently milled and the Birch Hill area of the Central District reported milling more than 10,000 of pine lumber. Major improvement efforts were focussed on the Crane Pond Wildlife Management Area and Myles Standish Wildlife Management Area in the Southeast District and on the High Ridge Wildlife Management Area in the Central District.

Division staff members distributed hunting/fishing licenses and related stamps, regulations and informational material to over 450 license sales outlets, and picked up sales returns from the same. Personnel from most districts participated in one or more major exhibits helping to make the Division and its activities more visible to the general public and respond to inquiries from the sporting public. In addition to doing this at exhibits, such as the Eastern States Exposition, the Eastern Fishing

Exposition, the Boston Camping and Outdoor Show and the Topsfield Fair, staff members presented programs for clubs, civic organizations, sportsmen's groups and school groups as possible.

INFORMATION & EDUCATION

Ellie Horwitz
Chief
Information and Education

Press Contacts

Expansion of existing programs made fiscal 1983 a very active year for the Information and Education Section. Emphasis was placed on increasing press response to Division news. During the year, the section issued 16 press release packets comprising 108 individual release items and another eight packets comprising 13 items which went only to outdoor writers on the TIPS list. In all, the Section mailed out 121 press releases in 24 packets to a total of 1,501 outlets (media, sportsman's clubs, conservation organizations and town clerks). Press reponse was excellent with an analysis of press release use for calendar year 1982 showing an average of 188.67 instances of press release use per month. This represents a significant increase in coverage over the previous high of 163.4 per month (1979) and the 1981 average of 150.5 clippings per month. Four months saw clipping returns of 200 clips or better which has been the criterion for a prime month.

In addition to the releases, members of the press and electronic media were invited to participate in six special events during the year: a press tour of the eagle hacking site at Quabbin, previews of the eagle film and slide show in Boston and Springfield, an outdoor writer's day at the Westboro Field Headquarters, the release of wild turkeys in Northern Worcester County, the first stocking of the Millers River in 25 years and a media day related to salmon restoration. Numerous writers and television crews availed themselves of the opportunity. In addition, the Division worked with Channel 7 (Boston) to produce a deer season special focussing on central and southeastern Massachusetts.

In addition to the above Division-initiated programs, the Section also responded to hundreds of inquiries for information and materials from journalists and reporters. Staff members provided fact sheets, photographs, radio interviews and television appearances. One such request led to a series of short radio spots for station WDLW (Waltham) which was ultimately run as a series of 13 sponsored wildlife news spots run at intervals throughout the week.

Private citizens too sought out the Division for information regarding legal questions, questions of natural history, information on Division lands and other public lands, and requests for assistance in vacation planning, etc. To meet those needs, staff members Horwitz, Mirick, and D'Angelo fielded telephone inquiries and mailed out more than 10,000 items (maps, permits, regulations) in addition to providing personal written responses whenever needed.

Publications

Many of the inquiries were answered with Division publications. During the year, all annual publications (regulations, stocking lists, fishing access information and other routine publications) were updated. In addition, the Section prepared and produced a map of the newly established deer hunting zones, combined state and federal waterfowl hunting regulations, provided a listing of pond maps available, published five new pond map booklets, a list of fish in Massachusetts and brochures on bald eagles in Massachusetts, the Sportfishing Awards Program, the Waterfowl Stamp Program and mole salamanders. Initial steps were taken to prepare a revised edition of the highly popular Sportsmen's Guide to the Quabbin Area which needs extensive revision and should be printed in a more uniform fashion than in the past in order to meet the demand.

"MASSACHUSETTS WILDLIFE", the Division's prime publication was reduced to a single issue because of financial constraints. This issue was published in March and offered 32 pages instead of the usual 24. In light of the difficulties of supporting Massachusetts Wildlife and the reduction in publication over the past years, Editors Mirick and Horwitz spent considerable time exploring alternative sources of funding for the magazine. Avenues investigated involved both private and state channels as well as participation in a cooperative group for state wildlife magazines.

Exhibits

As in other years, the Division participated in a number of shows designed to increase program visibility. During 1982-83, the selected focus was on the restoration of the bald eagle. Information and Education staff worked closely with District personnel in preparing exhibits for the Eastern States Exposition in Springfield, the Camping and Travel Exposition in Boston, the Eastern Fishing Exposition in Boxborough and the Framingham Sportsmen's Show. In addition, photographs and display materials were prepared for District participation in shows in their areas. Hundreds of thousands of visitors passed through these exhibits and viewed the replica of the hacking tower, a bald eagle and a photo exhibit which documented the project itself.

Shows

All members of the Section participated in presenting slide and film shows to both technical groups and general audiences. Many of the programs dealt with the eagle restoration project, but others involved the deer program, turkey restoration and Division activities in general.

Groups requesting such services from the Division included school groups, garden and civic clubs, sportsmen's groups, senior citizens, the Massachusetts Herpetological Society, outdoor writers and hunter safety coordinators. When the Division offered a graduate seminar to wildlife students at the University of Massachusetts, Amherst, the Section not only put on one of the sessions, but prepared slides and visual material for use by the biologists offering all of the other sessions. Section Chief Ellie Horwitz presented a paper on the Section's Tags 'n' Trout Program to the Information Session of the Northeast Fish and Wildlife Conference.

Photography

In addition to the many support functions performed by the Section's photographers, they both continued to increase the Division's still photo and film collection by photographing project activities and general wildlife throughout the Commonwealth. Photographer Byrne spent many days shooting material for use in a future nongame slide show and both he and photographer Swedberg polished and completed a slide presentation for children prepared by the Division in conjunction with the Massachusetts Wildlife Federation.

Special Programs

The Freshwater Sportfishing Awards Program drew 400 entries during the year and six new weighing stations joined the program. Two new state records were set, one for lake trout and one for bluegill. Ex-tern Steve Quinn from the University of Massachusetts tabulated sportfishing awards data from 1970 through 1982 and presented a paper on his findings at the Northeast Wildlife Conference. Tags 'n' Trout drew 15 participating groups during the summer of 1983, which sponsored 395 specially tagged fish in 16 bodies of water. Prizes offered and publicity issued by local sponsors were excellent and sportsmen enjoyed the program as evidenced by their return of 60% of the tags.

National Hunting and Fishing Day - The Division again coordinated signing of the Governor's proclamation and publicized activities sponsored by clubs relating to the day.

The Waterfowl Stamp Program celebrated its 10th anniversary with a gala show at the Peabody Museum won by Randy Julius for his painting of a Redhead Drake. This was followed by a special luncheon for invited guests. The highlight of the luncheon was the unveiling of a stamp history/album entitled "A History of Waterfowl Stamps in Massachusetts" prepared by C. G. Rice and published by the Peabody Museum.

Archery Stamps - This year's archery stamp was printed from a drawing donated to the Division by artist John Eggert.

Conservation Camp - As in the past, the Section was heavily involved with the Massachusetts Junior Conservation Camp. This involvement ranges from participating in Board sessions which voted to separate the camp from the existing Fund for the Preservation of Wildlife and Natural Areas and establish it as a separate entity through publicity for the camp, registration of campers and making arrangements for the actual camp session.

During early 1983, a new brochure was prepared for the camp and a new medical form was adapted from the American Pediatric Association. In an effort to increase scholarship funding available to prospective campers, section staff approached prospective donors and obtained undesignated scholarships from the Digital Equipment Corporation, from a private donor and from the Middlesex County League of Sportsmen's Clubs. Staffer Peter Mirick joined forces with district game manager Peter Pekkala to teach the wildlife segment of the program while members of the fisheries section taught the segment on lake and pond ecology. A similar teaching program was conducted later in the summer for the Marlboro Junior Conservation Camp.

Wildlife Projects

Section staff members continued their participation in projects outside the information area with photographer Jack Swedberg taking the lead in the Division's eagle restoration program (detailed in the nongame section) with photographer Bill Byrne deeply involved in assisting on the project. Journalist Peter Mirick coordinated part of the statewide survey of salamanders and continued to serve as consultant on herpetological matters, while section leader Horwitz continued to participate in survey and inventory of bats.

Other

No discussion of ongoing projects can touch on all of the activities of the Section. During this past year, activities of the Section included participation in the Division's overall planning process and preparation of a policy document to supercede the previous policy written in 1957. Participation in planning for a proposed herd reduction program to take place at Crane Reservation, Ipswich, preparation of a special holiday envelope for those who like to give sporting licenses as gifts, inauguration of an in-house newsletter called "The Whispersheet" and preparation of two issues of the same, maintenance of a statewide deer season hotline to gather and give out information on deer season results, establishment of a certificate program for hunters taking noteworthy deer, updating of the mailing list of sportsmen's organizations and preliminary investigation together with staff of the Massachusetts Audubon Society, of the possibility of Massachusetts participation in a national education project entitled Project WILD, pioneered in the western states and offering an educational curriculum based on wildlife.

REALTY

Floyd Richardson
Chief of Wildlife Lands

This report does not disclose the procedure nor the effort expended to acquire a parcel of land. To list and explain the steps necessary would be lengthy and uninteresting.

Consequently, the following is an annual disclosure of the results achieved by this Realty Section.

Housatonic River Acquisition Project	811.9 acres

A gift of land containing one-half acre was gratefully received by the Division adding another segment to the planned corridor along the Housatonic River. This area provides multiple-use recreation with its scenic river paths that afford waterfowl and songbird observation, forest lands, wetlands and agricultural lands so vitally important to the wildlife species indigenous to the area while the River also provides for the fishing and canoeing enthusiasts.

Windsor Acquisition Project	1,147.0 acres

An acquisition of a 45 acre parcel in the Town of Windsor adjacent to the Moran Wildlife Management Area which contributes additional access and excellent wildlife land. The property consisted of hard and softwood trees interspersed with high-bush blueberry, wild apple trees from abandoned farms of yesteryear, and a profusion of wild raspberry growing adjacent to an open pasture. An additional amenity included with this acquisition was approixmately one-half mile of Windsor Brook, a stocked trout stream.

Hinsdale Flats Acquisition Project 1,063.0 acres

Acquiring this 117 acre parcel permits 1,400 feet of ready-access to the management area from Route 8, its westerly perimeter.

Diversity of cover and wildlife food is offered through open fields, brushlands, forest and marshland and further enhances the management area of which it has become a part.

Millers River Acquisition Project 1,932.3 acres

Two parcels containing a total of 75 acres under one ownership were acquired in the Town of Athol. Their importance to the wildlife management area, aside from their contribution of food and cover for wildlife, was the fact that each was an interlocking parcel providing contiguous ownership, eliminating previous breaks in the chain of ownership.

This project now extends from the Town of Royalston to the south side of the Millers River in Athol where it abuts Athol Conservation Commission lands.

Phillipston Acquisition Project 2,799.5 acres

Queen Lake Road, Route 101 runs through the Phillipston Wildlife Management Area. An acquisition of 51 acres in the Town of Phillipston became an important connecting link between Division lands on each side of the above-mentioned road. This acquisition furnishes additional wildlife lands, joins two large segments of Division land and prevents encroachment by development.

Crane Pond Acquisition Project 2,122.6 acres

A gift of land was presented to this Division by one Mary D. Steele. The parcel contained 18 acres in the Town of West Newbury lying east of Middle Street. The gifted property consists of a freshwater marsh and adjoins other Dision owned lands originally known as the Crane Pond Area.

SUMMARY OF LAND ACQUISITION

FISCAL YEAR 1983

Area Name	Town	Acreage
Housatonic River	Pittsfield	.50
Moran Area	Windsor	45.00
Hinsdale Flats	Hinsdale	117.00
Millers River	Athol	75.00
Phillipston Area	Phillipston	51.75
Crane Pond	West Newbury	18.10
	TOTAL:	307.35

Maintenance & Development

John P. Sheppard
Chief
Maintenance and Development

Hatcheries

A vertical turbine pump and bowl assembly was installed at the McLaughlin Hatchery in Belchertown.

Districts

The regrading of the existing roadway and parking area at the West Meadows Wildlife Management Area was completed.

A new canoe and small boat access was constructed at the Hockomock River, Hockomock Wildlife Management Area.

The existing security system was updated and installed at the Central Wildlife District office.

All existing drives and parking areas at the Southeast Wildlife District office have been repaved.

New storm windows were installed at the Division owned residence in Harvard, Massachusetts.

Structural steel security gates were installed at various locations statewide.

Field Headquarters - Westboro

New storm windows and ceiling insulation were installed at the Field Headquarters. Also bituminous concrete paving of all roadway and parking areas at the above area were completed.

Other

The engineering sections also provided assistance in the design and construction of public boat launching facilities at Fort Pond, Lancaster and White Pond, Concord.

PERSONNEL ACTIONS

Sixty-three personnel changes were undertaken during this fiscal year with the majority being promotions and appointments. The Division notes with sorrow the passing of John Kostro, Conservation Skilled Helper on October 21, 1982.

Retirements

Name	Job Title	Date
A. Scotia	Principal Clerk	02-28-83
F. Sorocco	Senior Clerk & Typist	12-31-82
J. Petronino	Assistant Game Culturist	08-14-82
L. Majka	Conservation Helper	03-26-83
A. Souza	Conservation Helper	09-01-82
A. Roman	Fish Culturist	11-30-82
W. Neale	Wildlife Mgmt. Area Supervisor	08-17-83
G. Kuczma	Assistant Fish Culturist	08-26-83
F. Tarsa	Conservation Helper	08-17-83

Resignations

Name	Job Title	Date
K. Condon	Senior Clerk & Typist	08-14-82
C. McCord	Administrator II	03-31-83
K. Amara	Junior Clerk & Typist	08-28-82
T. Staples	Conservation Skilled Helper	01-01-83
M. Pottle	Junior Clerk & Typist	09-21-83

Appointments

Name	Job Title	Date
M. Marenghi	Junior Clerk & Stenographer	01-02-83
C. Croken	Junior Clerk & Stenographer	09-27-82
E. Robidoux	Senior Clerk & Typist	04-17-83
P. Holland	Junior Clerk & Typist	10-29-82
M. Flynn	Junior Clerk & Typist	04-10-83
A. Foley	Conservation Helper	01-03-83
G. Zima	Conservation Skilled Helper	09-07-82
J. Hahn	Fish Culturist	01-09-83
M. Pottle	Junior Clerk & Typist	02-28-83
R. Maietta	Conservation Helper	01-23-83
C. Campbell	Junior Clerk & Typist	10-12-82
D. Rose	Conservation Helper	02-05-83
W. MacCallum	Administrator II	09-08-83
J. Williams	Assistant Fish Culturist	10-09-83
J. Hazard	Conservation Helper	07-17-83
M. LaFleur	Junior Clerk & Typist	09-25-83

Promotions

P. Sutliff	Senior Clerk & Typist	08-18-82
C. Croken	Senior Clerk & Typist	01-02-83
R. Costello	Senior Bookkeeper	01-02-83
D. D'Angelo	Senior Clerk & Typist	08-29-82
J. Almeida	Assistant Game Culturist	09-27-82
J. Kirvin	Conservation Skilled Helper	01-23-83
A. Pellegri	Assistant Fish Culturist	12-26-82
F. Pietryka	Fish Culturist	10-31-82
M. Masley	Fish Culturist	12-26-82
P. Jackson	Fisheries Manager	08-29-82
A. Scotia	Principal Clerk	01-02-83
C. Croken	Senior Clerk & Stenographer	10-02-83
N. Limosani	Principal Clerk	10-02-83
D. Carlson	Wildlife Mgmt. Area Supervisor	10-02-83
P. Sutliff	Senior Bookkeeper	10-02-83
R. Thomasian	Conservation Skilled Helper	10-02-83
M. Marenghi	Senior Clerk & Typist	10-02-83
E. LaBonte	Conservation Skilled Helper	07-17-83

Other

D. Rose	Conservation Helper	05-22-83
M. Dumont	Conservation Helper	01-06-83
R. Norton	Conservation Helper	09-05-82
D. Bielecki	Conservation Helper	06-27-82
N. Pratt	Conservation Helper	05-22-83
C. Ayers	Conservation Skilled Helper	12-26-82
J. Nowakowski	Conservation Helper	05-21-83

Other (Continued)

Name	Job Title	Date
J. Besse	Assistant Fish Culturist	10-30-82
C. Campbell	Junior Clerk & Typist	03-19-83
J. Besse	Assistant Fish Culturist	12-26-82
M. Brideau	Conservation Helper	05-21-83
W. Minior	Wildlife Rest. Proj. Field Agent	08-14-83
J. Kerr	Conservation Helper	08-28-83
R. Maietta	Conservation Helper	08-30-83
G. Galas	Conservation Helper	07-17-83

LEGISLATION

Enacted During Fiscal Years 1982 and 1983

Chapter 39 - Acts of 1982. An Act Providing for the Use of Special Equipment by Handicapped Hunters.

Chapter 287 - Acts of 1982. An Act Relative to the Acquisition by the Department of Environmental Management of South Cap Beach in the Town of Mashpee.

Chapter 602 - Acts of 1982. An Act Authorizing the Commissioner of Administration to Set Fees and Charges Paid to the Commonwealth.

Chapter 330 - Acts of 1983. An Act Relative to Funding for Nongame Wildlife Programs in the Commonwealth.

Chapter 404 - Acts of 1983. An Act Authorizing the County Commissioners of Berkshire County to Acquire Certain Park Land in the Town of Windsor four Highway Purposes.

Chapter 538 - Acts of 1983. An Act Increasing the Surety Bond of Persons Authorized to Issue Licenses for the Division of Fisheries and Wildlife.

Chapter 610 - Acts of 1983. An Act Relative to the Connecticut River Salmon Compact.

Chapter 617 - Acts of 1983. An Act Authorizing the Division of Capital Planning and Operations to Grant a Certain Easement Over Certain Land in the Town of Middleboro.

Chapter 658 - Acts of 1983. An Act Protecting the Connecticut River.

Chapter 656 - Acts of 1983. An Act Designating a Certain Section of the Lake Quinsigamond Bridge in the Town of Shrewsbury in Honor of Kenneth F. Burns.

COMMONWEALTH OF MASSACHUSETTS
DIVISION OF FISHERIES AND WILDLIFE
July 1, 1982 to June 30, 1983

"HOW THE SPORTSMEN'S DOLLAR WAS SPENT"

	Account No.	Expenditures		Percentage
Administration				
Administration	2310-0200	$ 518,278.60		
Information-Education	2310-0200	153,167.78	$ 671,446.38	12.54%
Wildlife Programs				
Game Farms	2310-0400	549,143.77		
Wildlife Management**	2310-0400	811,812.58		
Wildlife Cooperative Unit	2310-0400	72,000.00	1,432,956.35	26.77%
Fisheries Program				
Fish Hatcheries	2310-0400	791,396.43		
Fisheries Management**	2310-0400	612,635.23		
Fisheries Cooperative Unit	2310-0400	72,000.00	1,476,031.66	27.57%
Nongame and Endangered Species Program				
Administration, Management and Research	2315-0100		44,199.92	.83%
Land Acquisition				
Acquisition of Upland Areas and Inholding on Existing Areas***	2310-0310		101,391.25	1.89%
Engineering and Construction				
Development and Improvement of Facilities for Public Use*	2310-0300		96,782.68	1.81%
Dept. of Fisheries, Wildlife, and Recreational Vehicles				
Natural Resource Officers' Salaries and Expenses	2350-0100 (30%)		544,932.12	10.18%
Hunter Safety Training****	2350-0101		111,029.38	2.08%
Transfers from Fund				
Group Insurance	1590-1007		310,719.86	5.80%
Salary Adjustments			265,150.00	4.95%
Retirements Assessment (.2%)	0612-1000		49,462.03	.93%
Interest on Bonded Debt	0699-2800		55,953.50	1.05%
Maturing Serial Bonds and Notes	0699-2900		194,000.00	3.60%
Total Expenditures			$5,354,055.13	100.00%

* Continuing Appropriation
** Portions of expenditures 60% or 75% reimbursable by Federal Government
*** Certain land acquisitions are 50% reimbursable by Federal Government
**** 100% reimbursable by Federal Government

APPROPRIATIONS AND EXPENDITURES
Fiscal Year July 1, 1982 to June 30, 1983

Account No.		Appropriations	Expenditures & Liabilities	Total Reversions
2310-0200	Administration	$ 673,234.00	$ 671,446,38	$ 1,787.62
2310-0400*	Wildlife Management	3,009,468.00	2,908,988.01	100,479.99
2315-0100	Non-Game Management and Research	50,000.00	44,199.92	5,800.08
		$3,732,702.00	$3,624,634.31	$108,067.69

		Continuing Appropriation	Expenditures	Balance Forward
2310-0300	Development & Improvement of Facilities for Public Use	$ 129,156.93	$ 96,782.68	$ 32,374.25
2310-0310**	Acquisition of Upland Areas and Inholding on Existing Areas	200,000.00	101,391.25	98,608.75
		$ 329,156.93	$198,173.93	$130,983.00

*** CAPITAL PROJECT

		Appropriations	Expenditures	Balance Forward
2670-9016**	Acquisition of Coastal & Inland Wetlands	$ 10,545.49	$ 5,000.00	$ 5,545.49

* Portions of 60% or 75% reimbursable by Federal Government.

** Certain land acquisitions are 50% reimbursable by Federal Government.

*** 1983 expenditures of $5,000. in Capital Projects are not shown "per se" in "How the Sportsmen's Dollar was Spent" as these bond projects are expended in Account No. 0699-2800 (Interest on Bonded Dept. and 0699-2900 (Maturing Service Bonds and Notes).

SUMMARY OF REVENUE CREDITED
TO THE
INLAND FISH AND GAME FUND
July 1, 1982 to June 30, 1983

Collected by Agency:

Fishing, Hunting and Trapping Licenses*	3304-61-01-40	$3,588,892.05
Trap Registrations*	3304-61-01-40	1,295.56
Archery Stamps*	3304-61-01-40	104,249.50
Waterfowl Stamps*	3304-40-01-40	7,031.20
Waterfowl Stamps - Ducks Unlimited*	3304-40-02-40	21,569.50
Special Licenses, Tags & Posters**		15,866.75
Antlerless Deer Permits	3304-61-14-40	30,777.95
Bear Permits	3304-61-14-40	4,120.00
Turkey Permits	3304-61-14-40	13,260.75
Rents	3304-63-01-40	17,371.37
Refunds Prior Year	3304-69-01-40	5,030.69
Sales, Other	3304-64-99-40	24,238.39
Miscellaneous Income	3304-69-99-40	1,039.76
		$3,834,743.47

Collected by State Treasurer:

Fines and Penalties	3308-41-01-40	36,300.00
Interest and Discount on Revenue	3395-60-01-40	24,757.58
		$ 61,057.58

Federal Aid Reimbursements:

Pittman-Robertson Federal Aid	3304-67-01-40	504,439.58
Dingell-Johnson Federal Aid	3304-67-02-40	266,566.72
Anadromous Fish Projects-Federal Aid	3304-67-04-40	164.97
Endangered Species Federal Aid	3304-67-11-40	43,213.93
Indirect Cost Reimbursement	3304-67-67-40	246,338.85
		$1,060,724.05

Taxes

Gasoline Tax Apportionment	3312-05-01-40	344,705.71

Transfers from General Fund:

Salary Adjustments	3360-95-02-36	265,150.00
Reimbursement on Half Price Licenses	3360-95-08-40	67,183.25
		$ 332,333.25

Reversions:

Accounts Payable		70,067.35
Total Revenue:		$5,703,631.41

* See Detail Sheet #1

** See Detail Sheet #2

Detail Sheet #1

DIVISION OF FISHERIES AND WILDLIFE
RECEIPTS FROM FISHING, HUNTING AND TRAPPING LICENSES
Fiscal Year July 1, 1982 to June 30, 1983

Type of License Class	Unit Price*	Quantity	Gross Amount	Fees Retained by City/Town Clerks	Net Returned to Commonwealth
01 Res. Cit. Fishing	11.25/12.50	121,239	1,514,557.50	44,914.75	1,469,642.75
02 Res. Cit. Hunting	11.25/12.50	52,506	655,696.25	21,689.75	634.006.50
03 Res. Cit. Sporting	16.50/19.50	57,815	1,124,329.50	22,509.25	1,101,820.25
04 Res. Cit. Minor Fishing	6.25/ 6.50	7,920	51,471.00	3,135.25	48,335.75
05 Res. Cit. Alien Fishing	14.25/14.50	1,081	15,673.25	431.50	15,241.75
06 Non-Res. Cit./Alien Fishing	17.25/17.50	4,830	84,500.75	1,668.00	82,832.75
07 Non-Res. Cit./Alien 7-Day Fishing	11.25/11.50	2,200	25,298.50	734.25	24,564.25
08 Non-Res. Cit./Alien Hunting (Small Game)	23.25/23.50	1,025	24,085.00	440.75	23,644.25
09 Non-Res. Cit./Alien C.S.P. 3-day Hunting	19.25/19.50	36	702.00	16.50	685.50
10 Res. Cit. Minor Trapping	6.25/ 8.50	253	2,132.50	112.75	2,019.75
11 Res. Cit. Trapping	14.50/20.50	1,057	21,530.50	458.25	21,072.25
12 Duplicates	2.00	3,464	6,928.00	-	6,928.00
13 Res. Alien Hunting	19.25/19.50	1,283	25,011.75	542.00	24,469.75
14 Non-Res. Cit./Alien Hunting (Big Game)	38.25/48.50	1,308	63,219.75	555.50	62,664.25
15 Res. Cit. Sporting (Over 70)	FREE	20,565			
16 Res. Cit. Fishing (Blind, Paraplegic, Mentally Retarded)	FREE	1,426			
17 Res. Cit. Hunting (Paraplegic)	FREE	148			
18 Res. Cit. Fishing (Age 65-69)	5.75/ 6.25	6,397	39,948.25	2,950.25	36,998.00
19 Res. Cit. Hunting (Age 65-69)	5.75/ 6.25	820	5,118.00	384.75	4,733.25
20 Res. Cit. Sporting (Age 65-69)	8.25/ 9.75	3,007	29,226.75	1,367.50	27,859.25
21 Res. Cit. Trapping (Age 65-69)	7.25/10.25	85	859.25	40.00	819.25
		288,465	3,690,288.50	101,951.00	3,588,337.50
22 Archery/Primitive Firearms Stamp	5.10	20,773	105,942.30	1,692.80	104,249.50
** Trap Registrations			1,295.56		1,295.56
		309,238	3,797,526.36	103,643.80	3,693,882.56
Collection on Delinquent Accounts			2,187.25		2,187.25
Collection on Bad Checks (previous Yrs)			377.00		377.00
Bad Checks Pending Collection			-1,555.25		-1,555.25
Refunds			- 454.45		- 454.45
		309.238	3,798,080.91	103,643.80	3,694,437.11
23 Waterfowl Stamps	1.25	26,630	33,287.50	5,029.80	28,257.70
" " (sold to collectors)		343	343.00		343.00
		336,211	3,831,711.41	108,673.60	3,723,037.81

* License price increase effective March 1, 1982.

** Trap Registrations(price increase effective January 1, 1983): Initials: 159 @ $2.00/$4.00 364.00
Renewals: 495 @ $1.50/$3.00 931.56

SPECIAL LICENSES, TAGS AND POSTERS
July 1, 1982 to June 30, 1983

Receipt Account	Type of Licenses	Quantity & Unit Price	Amount	Receipt Account Total
3304-61-02-40	Fur Buyers			
	Resident Citizens:	25 @ 15.00/25.00	595.00	
	Non-Residents or Aliens:	4 @ 50.00/75.00	275.00	870.00
3304-61-03-40	Taxidermists	86 @ 10.00/20.00		1705.00
3304-61-04-40	Propagators			
	Special Purpose Permits:	131 @ 1.00	131.00	
	Class 1 (Fish)			
	Initial:	35 @ 7.50/15.00	375.00	
	Renewal:	145 @ 5.00/10.00	1435.00	
	Class 3 (Fish)			
	Initial:	11 @ 7.50/15.00	135.00	
	Renewal:	74 @ 5.00/10.00	730.00	
	Class 4 (Birds, Reptiles, Mammals)			
	Initial:	51 @ 7.50/15.00	585.00	
	Renewal:	436 @ 5.00/10.00	4325.00	
	Class 6 (Dealers)			
	Initial:	16 @ 7.50/15.00	217.50	
	Renewal:	41 @ 5.00/10.00	405.00	
	Additional:	98 @ 1.50/ 5.00	986.50	
	Class 7 (Individual Bird or Mammal)			
	Initial:	8 @ 3.00/ 5.00	34.00	
	Renewal:	31 @ 1.00/ 2.00	62.00	
	Importation Permits			
	Fish:	3 @ 5.00/ 7.50	15.00	
	Birds or Mammals:	42 @ 5.00/ 7.50	277.50	
	Class 9 (Falconry)			
	Master:	6 @ 25.00	150.00	
	Apprentice:	17 @ 25.00	425.00	
	General:	12 @ 25.00	300.00	
	Class 10 (Falconry)			
	Raptor Breeding	3 @ 10.00	30.00	
	Class 11 (Falconry)			
	Raptor Salvage:	14 @ 1.00	14.00	10632.50
3304-61-05-40	Take Shiners:	100 @ 5.00/10.00		980.00
3304-61-06-40	Field Trial Licenses	9 @ 15.00		135.00
3304-61-07-40	Taking of Eels:	3 @ 25.00		75.00
3304-61-08-40	Quail For Training Dogs			
	Initial:	5 @ 7.50/15.00	37.50	
	Renewal:	25 @ 5.00/10.00	125.00	162.50
3304-61-10-40	Commercial Shooting Preserves:	10 @ 50.00		500.00
3304-61-12-40	Mounting Permits:	5 @ 2.00		10.00
3304-61-13-40	Special Field Trial Permit:	24 @ 15.00		360.00
3304-64-01-40	Tags and Posters			
	Game Tags:	5,745 @ .05/.10	324.75	
	Fish Tags	2,200 @ .02/.05	110.00	
	Posters	40 @ .05/.10	2.00	436.75
				$15866.75

CHANGES IN
FISH AND GAME FUND BALANCE
July 1, 1982 to June 30, 1983

Balance July 1, 1982 (Surplus)	$ 137,334,13
Total Revenue/ Credits	5,703,631.41
Total Expenditures	-5,354,055.13
* Increase in Continuing Accounts Brought Forward	-264,864.05
Balance June 30,1983 (Surplus)	$ 222,046.36

1982 Continuing Accts. Brought Forward		1983 Continuing Accts. Brought Forward	
Retirement Assessment (0612-1000)	$17,271.48	Retirement Assessment (0612-1000)	$257,808.
Dev. & Imp of Facilities for Public Use (2310-0300)	39,262.45	Dev. & Imp. of Facilities for Public Use (2310-0300)	24,965.
Law Enforcement (2350-0100)	52,500.00	Acquisition of Upland Areas and Inholding Areas (2310-0310)	568.7
Reserve for Encumbrances	14,894.48	Reserve for Encumbrances	105,440.
	$123,928.41		$388,792.

1983	$388,792.46
1982	-123,928.41
*	$264,864.05

Massachusetts Division of Fisheries and Wildlife Annual Report

1984

State Library of Massachusetts
State House, Boston

George Diroly

The Commonwealth of Massachusetts
Division of Fisheries and Wildlife
Leverett Saltonstall Building, Government Center
100 Cambridge Street, Boston 02202

DIRECTOR

His Excellency, Michael S. Dukakis, Governor of the Commonwealth, the Executive Council, the General Court, and the Board of the Division of Fisheries and Wildlife.

Sirs:

I have the honor to submit herewith the One Hundred and Nineteenth Annual Report of the Division of Fisheries and Wildlife, covering the fiscal year 1 July 1983 to 30 June 1984.

Respectfully submitted,

Richard Cronin

Richard Cronin
Director

PUBLICATION: #14,431-60-300-5-13-86-CR
Approved by Daniel Carter, State Purchasing Agent

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THE BOARD REPORTS

George Darey
Chairman

1984 proved to be a momentous year for the Division of Fisheries and Wildlife. Early in the fiscal year (July 26) the Governor signed the Nongame Wildlife Bill into law establishing a fund which would support expanded nongame activity and which authorized collection into that fund through a refund checkoff on state income tax forms. This posed a most exciting challenge as Division personnel were called upon to become involved in fund raising while the Division examined ways to expand the nongame effort and to incorporate the Natural Heritage Program which had been transferred to the Division from the Department of Environmental Management in the same bill. The Board salutes the Division on the smooth transition and the subsequent effective operation of the program. Fund raising progressed well. Initial projections had set the expected income as "just under $300,000." In fact, the fund received $380,000. Shortly after establishment of the Fund, a Nongame Advisory Committee was formally appointed. By May, that committee had completed an initial one year plan for the program and the Division had hired an Assistant Director, Dr. Thomas French, to head up the program replacing Brad Blodget who had chosen to serve as State Ornithologist.

This was just one of the many programs overseen by the Board in the pursuance of its regular duties. As in the past, the Board continued to consider a wide variety of issues, some of which have lead to changes in regulation while others had non-regulatory conclusions. Issues which were examined resulting in changed regulations include examination of the status of migratory birds and subsequent establishment of migratory bird hunting regulations, consideration of economic factors related to pheasant rearing which led the Board to approve the taking of hen pheasants west of a line beginning at Route 3 at the New Hampshire line continuing south to Route 495 and then south along Route 121 to the Rhode Island border. Other items established by regulation were:

-- establishment of a controlled deer hunt at the High Ridge Wildlife Management Area

-- expansion of turkey hunting to all counties and parts of counties west of the Connecticut River and increase of the number of permits to 3,800

-- elimination of the permits required for the taking of frogs

- -- establishment of a moratorium to run for one year from May 17, 1984 on the taking of Atlantic Salmon from the Merrimack River or any of its tributaries or the Connecticut River or any of its tributaries
- -- elimination of the requirement that all arrows be labelled with the owner's name and address
- -- a change in regulations pertaining to the taking of furbearers and specifically moving the dates for taking beaver to November 15 - the last day of February and changing the dates for taking otter to November 1 - December 15 with the requirement that otter carcasses must be given to the Division for analysis
- -- on the non-regulatory side, the Board approved a strategic plan for the Division and established guidelines for public participation at working Board meetings

The Board also spent time in consideration of issues not fully resovled during this year. One such was the status of Massachusetts Wildlife given the fact that gradually increasing costs have reduced publication to a single issue per year. This is the culmination of a trend the Board has seen in the past years as publication has gradually been reduced by increasing costs. At this point, it is apparent that in order to resurrect this outstanding publication, that a subscription system will have to be implemented. The Board has instructed the Information and Education Section to review possible subscription systems and has requested the Director to pursue establishment of a designated fund and of initial capital to establish such a system.

The Board also spent a great deal of time in consideration of the goose hunting issue which arose on the Danvers/Salem area. (This issue arose when certain residents complained about noise and shots from hunters legally hunting geese on the Beverly side of the Danvers River.

The financial status of the Division has been fairly secure during this period with a healthy revenue from hunting and fishing licenses and half of the funding for the new nongame program being provided by the general fund. This, combined with a reduction in the amount needed for support of the Division of Law Enforcement, made it unnecessary to seek any increase in license fees despite increasing costs. Land acquisition became a high priority as the Division received allocations of $5 million for acquisition of land along coldwater rivers and streams; $5 million for additions to existing Division lands and $5 million for the purchase of inholdings within Division areas.

This year also saw a strengthening of personnel as, in addition to Dr. French, the Division acquired the services of Wayne MacCallum who became Assistant Director for Wildlife Research in August of 1983 and Joy Merzer, Information and Education Consultant for the nongame program. Along with this, there was a broad upgrading of secretarial staff in Boston increasing stability in this area. The Board itself was strengthened by the addition of John F. Creedon, Brockton, as regional representative from the Southeast.

PLANNING

Kristine L. Corey
Junior Planner

The Fish and Wildlife Board gave approval in October, 1983 to release the draft Strategic Plan for formal public review. Notices were published in newspapers statewide, in the Environmental Monitor, a bimonthly publication of the Executive Office of Environmental Affairs, and copies were sent to the central planning agency and each regional planning agency. Copies of the plan were available for review at the Boston Office, Westboro Field Headquarters, and each District office. About two dozen individuals or groups took this opportunity to inspect the document over a 45 day comment period. Only three written comments were received.

The U. S. Fish and Wildlife Service also reviewed the draft Strategic Plan and provided comments based on an evaluation of complince with federal aid planning standards and noting that on the whole, only minor changes needed to be made. The Wildlife Section, however, did not meet with federal approval primarily due to a deficiency of measurable objectives. Under the belief that the current plans adequately address Division needs, it was requested that the wildlife section be allowed to proceed in their planning effort without major modification of species plans.

The decision was made to continue federal aid funding on a project basis until it becomes feasible to implement program funding through planning. Data processing capabilities which would allow this option are not presently available in-house. Initiatives have been developed as part of an agency ADP plan to justify the need for upgrading the Division's computer capability. A request has been filed to reactivate a vacant junior planner position, preferably to be filled by a planner with skills in data processing.

FISHERIES

Peter H. Oatis
Assistant Director of Fisheries

Quabbin Investigations

Smelt were observed spawning in six of ten monitored streams. Estimates of egg deposition and hatching observed at all six streams indicate that deposition varied with the amount of available spawning habitat while survival ranged from a high of 84% in Gibbs Brook to 57% in Egypt Brook. Laboratory studies to determine the effect of acidity upon smelt egg fertilization proved inconclusive and will be redone in 1985. A new state record lake trout, 21 lb. 13 oz., caught in Wachusett Reservoir, broke the existing 21 lb. 3 oz. Quabbin record. Lake trout anglers creeled 6,565 lakers and released an additional 3,591 fish. Catch rates and total catch of smallmouth bass indicate good survival of the 1980-81 year classes of bass. Creel estimates reveal a total catch of 54,242 bass of which only 7,022 were creeled. These figures reflect the concious effort on the part of many bass anglers to limit their creel instead of creeling their limit. Rainbow trout continued to demonstrate poorer survival and contribution to the catch than other species. Only 979 rainbows were taken. However, for the second consecutive year , a good class of landlocked salmon (18,150 from Reed Hatchery plus 5,000 from New Hampshire) were released. The creel survey indicates that at least 1,642 sub-legal fish, average 14 to 17 inches, were caught. We expect numerous 18" (legal) salmon to enter the harvest during the summer and fall of 1984.

The heavy rains that occurred in late May caused the release of 33,000 unscheduled brown trout and display pool trout from McLaughlin Hatchery into Quabbin. The catch of a new state record rainbow trout (13 lbs.) eclipsing the existing record (8 lbs. 5 oz.) by 4 lbs. 11 oz. certainly reflects the release of display pool fish.

Experiments were also conducted with caged trout and salmon of selected tributaries to assess the potential impact of low pH and high aluminum content. Differential survival of caged fish documented and defined early spring toxic zones off the mouth of the west arm tributary streams. Further investigations along these lines will be underaken during the summer of 1984 in an attempt to define the time duration of these acutely toxic areas.

Stream Improvement

The efforts of volunteers and Connecticut Valley District personnel continued to improve stream habitat throughout the catch and release area of the Swift River below Windsor Dam. Dam repairs at the Merrill Pond System were completed.

Three ponds in the Southeast District: Fresh Pond, Big Sandy Pond and College Pond, all in Plymouth, received 80 tons of limestone to combat increasing acidity. It was determined that the Division would have to prepare a generic Environmental Impact Report to continue its pond and lake liming program. Preparation of this statement is underway. Scoping sessions were held in Boston and Orleans during May and the report is expected to be completed by the fall of 1984. The report lays out basic criteria that a water body must meet before it is determined that the addition of limestone will be beneficial to combat increasing acidity.

Smelt eggs were transported from Quinsigamond Lake and Wachusett Reservoir to Fort Pond, Lancaster; Lake Mattawa , Orange; South Pond, Brookfield; and to the state of New Hampshire. Landlocked alewives were transported from Singletary Lake to Webster Lake. These introductions will augment the existing base of forage species. The introductions are predicated upon through fish surveys and analysis of plankton availability.

Anadromous Fish

The dedication of the Bellows Falls Fishway was a high point of the Connecticut River Restoration Program. With the completion of this project by New England Electric Company, salmon have access to a significant portion of their historic spawning range and shad will have access to suitable habitat beyond this historic range.

A total of 87 salmon returned to the Connecticut, 66 were removed from the Holyoke Fishway which also passed 500,000 shad. Improvements in the fishway at Turners Falls resulted in the successful passage of 4,300 shad and two salmon.

Anglers enjoyed a banner year of shad fishing in Holyoke. The successful fishing is attributed to ideal water conditions and large fish attraction to Holyoke prior to the heavy rains of the Memorial Day weekend.

Connecticut River

A total of 410,000 salmon smolts were released into the Connecticut River, of these, 30,000 were produced at Roger Reed Hatchery and were released into the Massachusetts section. 60,000 parr fry were stocked into the Deerfield Watershed.

Merrimack River

Ground was broken for construction of the Lowell Hydro Facility. Although operation is not expected until late 1985 or early 1986, the fishway, over the Pawtucket Dam, should be operational by the spring of 1985.

Although highwater and some mechanical problems continued to impede efficient operation of the Essex Fishway in Lawrence, 5,488 adult shad and 100 salmon were passed. An unusual 77% of the salmon run was comprised of grilse - precocial males with only one winter at sea. This may indicate excellent survival of the 1983 smolt migration or a greater influence. Salmon stocking amounted to 67,000 smolt, 23,300 parr and 525,000 fry.

The creeling of salmon from the Merrimack and Connecticut Rivers was protected by regulatory action of the Fisheries and Wildlife Board on May 17, 1984.

New regulations pertaining to the taking of salmon in the Connecticut River will be promulgated by the Connecticut River Atlantic Salmon Commission in 1985. No legislation action was generated on H. B. 113 which would define inland-marine jurisdictions on the Merrimack River.

An initial creel survey of the shad fishway at Lawrence indicates 4,020 anglers spent 9,934 hours to catch 6,147 shad. Release rates approximated 72%. The state shad record, established as 9 lbs. 10 ozs. from the Connecticut River in 1983 was tied with by a shad from the Merrimack River caught in May in Lawrence. Anglers harvested approximately seven salmon prior to the closure of the fishway.

Sea-Run Brown Trout

Thirteen days of broodstock collection yielded 19 males and 25 females averaging 18 to 20 inches. These fish plus five recycled females produced 65,000 eggs. Once again, infections at all stages of development from brood fish through smolt production, continued to plague this program. Of the 34,000 eggs collected in 1982, only 18% (6,362) survived to the smolt stage by March of 1984. Despite these problems, the program continues to attract the interest of many anglers. It is hoped that reassignment of personnel at the East Sandwich Hatchery will help in resolving the difficulties encountered in rearing these fish.

Fisheries Surveys: Streams and Lakes

Streams

Biologists intensively sampled 73 biological and 67 chemical replicates on 130 streams across the state. These data will aid in establishing estimates of variation for streams sampled between 1979-1982. Parameter studies include fish abundance, species diversity as well as chemical and physical properties of the streams.

The results of the impact of increasing acidification on the Millers River Watershed were presented at numerous conferences in both oral and poster presentations. Part II of the Massachusetts Stream Classification Program - Physical Characteristics (stream length, gradient, watershed area, etc.) was drafted in cooperation with the Massachusetts Department of Water Pollution Control.

Lakes

District and Headquarters personnel completed fisheries assessments surveys at 30 lakes and ponds. These assessments provide the basis for establishing and evaluating lake fisheries regulations, documentry need and niche for prey or predator introductions (e.g. smelt, alewives, pike and tiger muskies) or aquatic weed problems. Since 1979, three hundred lakes have been survyed. These waters encompass the most heavily fished lakes in the state. Operating on a sound data base, future lake fisheries efforts will be directed towards more intense management addressing unique problems associated with these more popular lakes.

Additional surveys at lesser used lakes will be conducted in conjunction with environmental assessments. These surveys will include evaluating the effects of mitigative programs, evaluation of dredging and drawdown operations or monitoring the effects of acidification.

Intense assessments of tiger muskie and northern pike introductions are to be conducted in 1985. Additionally, the need for special regulations designed to address specific fisheries problems at specific lakes will again be brought to the Fisheries and Wildlife Board for their deliberations.

Acid Rain Monitoring

The Division continued to cooperate and fund the Acid Rain Monitoring Program through the Massachusetts Water Resource Research Center. Collections were completed for approximately 28% of the state's water bodies. Plans were formulated for completing the sampling on all state waters during 1984-1985. Initial findings generated to date indicate that many lakes and streams located in Southeast and Northcentral Massachusetts are already in a critical or acidified state with respect to their ability to buffer additional acid inputs.

The Division is planning to mitigate the effects of aquatic acidification where and when practical through the addition of ground limestone. Numerous studies and investigations to resolve acid problems are in the initial planning stage.

Technical Assistance

A great deal of time and effort was directed at investigating, commenting and formulating Division positions regarding relocation of Route 2 in Erving. Additional assistance was provided to the Division of Water Pollution Control in sampling fish from rivers and lakes that pose potential heavy metal and Dioxin problems.

Urban Angler

Over 350 students attended learn-to-fish clinics in Brockton, Canton, Randolph, Georgetown, Taunton, Wellesley and Worcester. 33 instructors participated and donated over 1,000 hours of volunteer time. Special events included participation in Boy Scout Jamborees, the Springfield Exposition, the Boxboro Sportsmen's Show and Kivver and Carp Festival in Taunton. The coordinator also worked with fisheries staff members in other states to initiate similar programs in Connecticut and New Hampshire.

HATCHERIES

David Fredenburgh
Chief Fish Culturist

During the 1984 fiscal year, the hatcheries produced 1,311,978 fish weighing 536,076 pounds. Of that number, 673,975 were nine inches or better. In addition to the production figures, there was 136,500 fignerlings produced at the McLaughlin Hatchery for distribution to the other hatcheries.

Normal maintenance projects were carried on at all of the hatcheries. The East Sandwich Hatchery continued upgrading its facilities including a project which involved renovating an existing building into an office. Also at East Sandwich, pools were re-built and additional netting was installed to lessen bird predation.

Along with normal maintenance and activities, Sunderland Hatchery completed fencing around many pools to reduce predation by Great Blue Herons. The fencing around the ponds greatly reduced this problem. The hatchery has also increased its efficiency by the use of rainbow trout eggs received in early fall. These eggs allow the hatchery to produce catchable yearlings rather than two year fish.

The tiger muskie program at the Roger Reed Hatchery suffered another set back when these fish were poisoned for the second year. Intense investigations were carried out and plans were developed to expand the fencing perimeter, put partitions around the tanks, construct a substantial cover over the tanks and increase lighting. The hatchery personnel have been very successful in producing Atlantic Salmon smolts.

The pollution control project at the McLaughlin Trout Hatchery finally got underway with the selection of the engineering firm, Fay, Spofford and Thorndike, to update existing plans, prepare the bid package and be involved with construction. The Ciocca Construction Corporation of Springfield, Massachusetts was notified on June 5, 1984 that they were the successful contractor with a bid price of $545,000. Completion date for the project is expected to be in early December.

Because of an extremely heavy rainfall during the end of May, the water reached record spillway levels at the reservoir, and the pumping station at the McLaughlin Hatchery was threatened with high water from the flooding Swift River. A decision was made to evacuate the hatchery of fish and shut the electricity off. A total of 600,000 fish were evacuated to both the Palmer and Sunderland Hatcheries, as well as the Quabbin Reservoir. The river flooded to the level of the pump house floor before receding early in June. All in all it was a successful move to and from the hatcheries. Little damage was done to the hatchery due to the flood waters.

	1-3"	3-6"	6-9"	9+	12+	Total Fish	Weight
McLaughlin							
Rainbow	-	-	-	236,000	-	236,000	196,900
Brook	-	-	10,100	128,575	-	138,675	53,575
Brown	-	154,680	61,500	51,000	-	267,180	69,000
Totals	-	154,680	71,600	415,575	-	641,855	319,475
Montague							
Rainbow	-	-	-	51,350	-	51,350	49,550
Brook	-	-	-	10,000	-	10,000	6,950
Totals	-	-	-	61,350	-	61,350	56,500
Sunderland							
Rainbow	-	-	-	18,250	18,300	36,550	44,250
Brook	-	-	-	17,700	-	17,700	20,375
Brown	-	-	-	25,150	-	25,150	21,750
Totals	-	-	-	61,100	18,300	79,400	86,375
Palmer							
Brown	-	-	-	-	600	600	575
Brook	-	-	-	800	3,250	4,050	5,000
Tiger Muskie	-	-	-	350	-	350	65
Atl. Sal.	38,500	-	49,100	-	-	87,600	4,075
Land. Sal.	-	-	-	18,150	-	18,150	3,300
Totals	38,500	-	49,100	19,300	3,850	110,750	13,015
Sandwich							
Rainbow	-	-	25,850	67,000	-	92,850	35,875
Brook	20,000	-	25,600	10,750	-	56,350	11,450
Brown	30,000	62,000	10,450	16,750	-	119,200	10,750
Sea-Run Brown	-	-	14,750	-	-	14,750	2,785
Coho	-	-	148,000	-	-	148,000	7,150
Totals	50,000	62,000	224,650	94,500	-	431,150	68,010
GRAND TOTALS	88,500	216,680	345,350	651,825	22,150	1,324,505	543,375

(Transfers total 136,500)

WILDLIFE

Wayne F. MacCallum
Assistant Director of Wildlife

The Wildlife Research Section consists of one chief, three game biologists, two assistant game biologists, one restoration project field agent, and one conservation helper. This staff is responsible for research on and management of approximately 75 species of mammals, birds, reptiles, and amphibians which are traditionally hunted, trapped or otherwise taken for food, animal products, or sport. Additionally, the section is responsible for administering the Division's falconry program, for coordinating development of the Division's wildlife management areas, and for recommending to and advising the senior staff and Fisheries and Wildlife Board on matters of administration, regulation, and policy relative to the Commonwealth's wildlife resources. The section oversees three Federal Aid in Wildlife Restoration Projects (W-9-D, W-35-R, and W-42-R) comprising about 35 research jobs in addition to about four other jobs conducted by the Massachusetts Cooperative Wildlife Research Unit and supervised by the Division. Section biologists also coordinate with the Realty, Planning, Nongame and Information Sections when particular expertise on wildlife matters is needed. Summaries of current studies underway follow.

WATERFOWL

Pre-season Banding

Airboat nightlighting and bait trapping was used to band 477 wood ducks, 230 mallards, 69 black ducks, 15 mallard x black hybrids, 24 blue-winged teal, and 19 green-winged teal.

Statewide Goose Census

In late December, the Division conducted its first statewide goose count, in conjunction with the annual Audubon Christmas Bird Count. Division personnel covered areas of Massachusetts not covered by the Audubon bird counts. A total of 21,704 Canada geese were counted, 8,536 in inland areas and 13,168 along coastal towns.

Mid-Winter Waterfowl Inventory

A total of 286,413 waterfowl were counted during the January 1984 winter inventory, the highest count in more than 20 years due to the presence of 215,890 ducks. Black ducks (20,401) were up 21% over last year but unchanged (-1%) from the 10 year average. All other waterfowl were up well above last year's low count except scaup (-63%) and geese (-5%).

Winter Banding

December and January averaged below normal temperatures but were characterized by alternating cold and warm spells. Only 222 black ducks, 53 mallard x black hybrids, 3 mallards and 1 pintail were banded.

Wood Duck Nest Structure Study

No duck nests were started in plastic buckets on 13 new areas established during the winter of 1981-82, but seven wood ducks and one hooded merganser nested in wooden boxes on the same areas. Usage on 14 established wood duck box areas ran 30% for 46 buckets, 47% for 170 boxes and 25% for 12 metal cylinders. Success rate was 100% for nests in cylinders, 86% in boxes and 57% in buckets.

Biological Tagging of Wood Ducks

A total of 493 blood smears were read from birds sampled between 6 August and 15 October 1983. The blood parasite infection rate for birds from southern New England (primarily Massachusetts) was 89.4% for 1982 vs. 77.9% in 1981 and 79.3% in 1980.

Wood Duck Production Study

One hundred seventy-seven nest starts were recorded in 558 available structures on 50 areas across the state. There were 138 successful wood duck hatches and nine hooded merganser hatches.

Canada Goose Parts Collection Survey

A network of cooperators was established through a series of goose sex and aging workshops held across the state. Measurements were taken on 247 geese either bagged by sportsmen or collected by Parker River National Wildlife Refuge personnel. Data collected were computerized by Connecticut wildlife personnel. The measurements will aid in determining the origin of geese harvested in Massachusetts.

Experimental Waterfowl Season Appraisal

In 1983, Massachusetts modified its zoned waterfowl season by dividing the inland zone into a western and central zone. This was coupled with black duck harvest restrictions. Only one black duck was allowed daily in the western and central zones. We continued with a two black duck bag in the coastal zone but did not allow black duck hunting during 10 days in December, resulting in a 40 instead of 50 day season for black ducks. The central and coastal zone both opened 24 October after the start of the pheasant season. The waterfowl harvest remained generally unchanged but the wood duck harvest declined 62% from prezoning years while the black duck harvest declined 30%.

SMALL GAME

A total of 603 hunters were contacted to attain a sample of 400 small game hunters licensed in 1983. Hunters were surveyed to determine their participation and harvests during the 1983-84 hunting season.

Sampled totals were expanded to provide an index of total hunter participation, total hunter success, and total harvest. Average harvests were calculated as mean take. Pheasant, ruffed grouse, and cottontail were the preferred species ranked by hunter effort and hunter success. Pheasant, cottontail, and gray squirrel predominated in the bag.

The majority of waterfowl hunters (44%) hunted only in the coastal zone. Among all waterfowl hunters, an estimated 8,655 (51.6%) hunt the coastal zone, 6,295 (37.5%) the central zone, and 1,574 (9.4%) the western zone.

Hunters were also queired in this survey regarding deer hunting activity. The estimated number of deer hunters was calculated as 83,144, an increase of 6.2% over 1981-82 estimates. The number of participants engaging in archery and primitive firearms hunting increased by two-thirds over 1981-82; however shotgun hunters increased by only 5%.

BEAVER

The 1983-84 beaver season ran from 23 November to 29 February statewide. During this season, a total of 531 beavers were taken by 72 trappers in 78 towns, for a mean take of 7.4 beaver per successful trapper. This take represented a decrease of 53 beaver (-9.1%) from 1982-83. Decreases were most evident in Essex-Middlesex (-47.3%), Hampden (-41.4%), and Berkshire (-38.5%) counties and in Zones 06 (-96.2%), 04 (-51.8%), and 01 (-46.7%). Increases were evidenced in Hampshire (+161.5%) and Worcester (+28.3%) counties and in Zone 03 (+25.3%). Trapper take decreased in December and increased in February. Pelt prices continue to be low.

Commencing in 1984-85, the beaver season will run from 15 November until the last day of February: with the provision that no Conibear-type traps greater than #110 or equivalent shall be allowed after 15 January.

OTTER AND FISHER

During the 1983-84 otter season, 58 successful trappers took 119 otter in 59 towns in nine counties for an average of 2.0 otter per successful trapper. This compares with a harvest of 106 and an average of 2.3 in 1982-83.

The fisher take decreased from 140 in 1982 to 124 in 1983, with 57 successful trappers taking an average of 2.2 fisher each among 49 towns in seven counties (64 trappers averaging 2.2 in 1982).

Worcester (55), Essex (15), Hampden (13), and Franklin (12) counties and Zones 03 (37) and 02 (25) yielded the most otter and Worcester (63), Essex (23), and Franklin (17) counties the most fisher.

A total of 46 otter and 121 fisher carcasses were collected. The mean age of otter in 1983-84 was 1.97 and of fisher 1.62. This compares with 1.97 for otter and 1.56 for fisher in 1982-83. One-half (1, 50%) of the otter aged 2.5 and older and 19 (79%) of the fisher aged 1.5 and above during 1983-84 had been bred. This compares with figures of 100% for otter and 71% for fisher in 1982-83. Average corpora lutea counts were 2.5 for otter and 3.1 for fisher in 1983-84, and 2.4 and 2.9 respectively in 1982-83.

Commencing in 1984-85, the otter season will run from 1 November until 15 December, with mandatory carcass turn-in.

BOBCAT HARVEST EVALUATION

A total of 28 bobcats were taken in 1983-84, including 14 by hunting, 13 by trapping, and one road kill. The mean take per successful hunter (N=13) was 1.1 and per successful trapper (N=11) was 1.2. Bobcats were trapped most frequently in November (92.3%) and shot in January (71.4%). Target selectivity is low for trapping (15.4%) and moderately high (64.4%) for hunting. In 1983-84, bobcats were taken in 19 towns in five counties. Kittens (0.5 age class) comprised 20% of the take. The average pelt price ($50.92) was the lowest since 1977-78.

COYOTE INVESTIGATIONS AND HARVEST SURVEY

A total of 34 coyotes were taken by 25 sportsmen in 26 towns and six counties during the 1983-34 hunting season. Nearly two-thirds (65%) of the kill was in November, with 11 hunters (32%) targeting specifically for coyote. Immature coyotes comprised 72% of the harvest. Fourteen mortalities from causes other than sport hunting were recorded.

MOURNING DOVE CENSUS

The total number of calling doves on three long-term standardized routes decreased 29% during 1983-84. Counts on all 18 comparable routes increased 14% (175 to 200) from 1983 to 1984.

BOBWHITE QUAIL CENSUS

The 1983 weighted call indices for Bristol County showed no significant change from the 1981 Bristol index or from a five-year (1973-1981) index of consistent routes. The 1983 weighted index for Plymouth County showed no significant change from the 1981 Plymouth index. Indices from all other counties and from the statewide total showed significant or highly significant changes from the 1981 Plymouth index. Indices from all other counties and from the statewide total showed significant or highly significant declines from 1981 indices and from a five-year (1973-1981) mean index, both for all routes and for consistent routes only.

WOODCOCK

The 1983 woodcock season harvest increased 12% over 1982, but was 21% lower than 1981.

The 1984 spring woodcock singing ground census count averaged 1.39 birds per route as compared to 0.67 birds per route in 1983; an increase of 107%. However, because of two disastrous springs (1982,1983) the excellent recovery returned the population to only slightly above the 1982 estimate of 1.27 birds (a record low at that time).

The spring of 1984 was colder than normal and a six-day period of rain in late May produced a rainfall of over nine inches in some sections of Massachusetts.

Because of this rainfall and the cold spring, good woodcock survival was doubtful, and because the singing ground census was still low, the Fisheries and Wildlife Board voted to continue with a two bird daily bag limit which had been in effect since 1982.

WILD TURKEY RANGE AND HARVEST EVALUATION

The fifth Massachusetts spring gobbler hunt was held during a two-week period in May 1984 in all counties and parts of counties west of the Connecticut River. A record number of 3,818 permits were allotted, for which a total of 5,376 applications were received. A record kill of 208 turkeys was attained, with a sportsman participation rate of 3,467 (91.2%) and a hunter success rate of 6.0%. The Berkshire county kill was 143 (69%); Franklin county 32 (15%); Hampden county 21 (10%); and Hampshire county 12 (6%). Adult males totalled 123, or 59% of the total kill.

Winter weather conditions hampered trap-and-transplant. A total of 25 turkeys (11 females, 14 male) were captured and processed. Twenty-one turkeys (11 females, 10 male) were released in Groton, Middlesex county, and an additional four toms were banded and released at two capture sites.

Recommendations for the 1985 season are to:

1. Increase season length to three weeks, beginning the first Monday in May.

2. Divide the three weeks into two periods — the first week and the second and third weeks combined.

3. Issue permits at the same rate as in 1984, but with equal number of permits (3,800) for each period.

4. A hunter can apply for only one period, but can designate a second choice.

FALCONRY

During 1984, the ranks of the falconers remained stable with 15 apprentice, nine general and six master falconry permits issued. The most frequently flown bird was the red-tailed hawk. Four breeding permits and 23 raptor salvage permits were also issued.

DEER

The 1983 statewide deer harvest for all seasons combined was 4,525 deer which is an increase of 514 over the 1982 harvest of 4,011. Seventy-four percent of the 1984 harvest came from the counties of Berkshire, Franklin, Hampshire, and Hampden. Worcester County contributed 12% (570 deer) of the state deer harvest and Barnstable County contributed 2% (115 deer). The islands of Dukes and Nantucket counties contributed 2% (154 deer) and 3% (137 deer) respectively. The remaining counties of Essex, Middlesex, Norfolk, Bristol, and Plymouth contributed 5% (208) deer to the overall harvest.

A total of 3,801 deer was taken during the December shotgun season; of this total, 2,670 were males and 1,131 were female deer. Archers took 413 deer (282 males, 131 females) and primitive firearm hunters harvested 303 deer (122 males, 181 females). Paraplegic sportsmen took three males and five females during their special hunt.

Successful hunters taking an antlered male during any season were allowed to hunt and take a second deer — but during the shotgun season a hunter must have been issued an antlerless permit to harvest an antlerless deer.

A total of 44,535 antlerless permit applications were received before the 1983 season. Seven thousand, two hundred sportsmen permits and 464 farmer-landowner permits were issued for mainland Massachusetts. The 1983 harvest of antlerless deer by permit holders was 1,372 deer.

Natural Resource Officers reported 467 non-hunting deer mortalities during the 1983 calendar year. Deer-vehicle collisions accounted for 73% of non-hunting mortality. Illegal kills, dogs, unknown causes, crop damage, and drowning accounted for the remainder of non-hunting mortalities.

BLACK BEAR

A total of 774 bear hunting permits were issued during 1983-84. Ten bears were taken; eight during the first period of the season and two during the second period. Eight males and two females were taken from Berkshire (5), Franklin (3), Hampden (1), and Hampshire (1) counties. Seven non-hunting mortalities were reported, including two road kills, two found dead, one nuisance kill, one capture mortality, and one euthanized. Seven nuisance complaints, including four beehive depredations, were received.

STUDIES CONDUCTED BY THE MASSACHUSETTS COOPERATIVE WILDLIFE RESEARCH UNIT

1. Wild Turkey Population Dynamics

Five of 16 birds instrumented during winter 1982-83 remained available for study as of 1 December 1983. These birds were monitored through February to obtain data on winter habitat use.

Trapping efforts in February and March provided 23 additional birds (20 females, 3 males) for the study. Monitoring efforts during and following spring dispersal concentrated on hens in order to detect onset of nesting behavior. All hens will be monitored through the breeding season to provide information on productivity. Hens with broods will be monitored through the summer to obtain data on brood habitat use.

Seven birds died during the report period. Three hens were lost to predation; one in the fall and two during the spring dispersal/nesting season. Two males were also lost through predation, and two were shot during the legal hunting season.

2. Ecology and Status of the Bobcat in Western Massachusetts

The second trapping season started in December 1983 and continued through March 1984. Eight adult bobcats (5 males, 3 females) captured 12 times in box traps, were weighed, measured, and collared with radio-transmitters. Movement, activity, and habitat data are presently being obtained. Four radio-collared bobcats died during the past year.

Snow-tracking data were obtained from 12 days of tracking seven collared bobcats (4 males, 3 females). Snow-tracking observations have been made to evaluate habitat use, feeding habits, behavior, and intraspecific interactions.

Twenty-seven bobcat carcasses were obtained for this study from the Massachusetts Division of Fisheries and Wildlife. Sex, age, and female reproductive status were determined from the carcasses, along with weight and length measurements. The digestive tract contents were removed for food habits analysis.

3. Black Bear Home Range, Movements, and Habitat Use in Massachusetts

This job was completed and a thesis prepared and approved. Findings are summarized below. A new job investigating sow-cub interactions, reproductive success, and cub survival will be initiated 1 July 1984.

Between May 1980 and July 1983, 63 different bears were captured and tagged in western Massachusetts. Thirty-five of these bears (13 males, 22 females) were radio collared and 24 (6 males, 18 females) were intensively monitored for over 20 months. Home ranges, 318 square kilometers for adult males, 28 square kilometers for adult females, 34 square kilometers for subadults, and 12 square kilometers for yearlings. Home ranges did not represent exclusive terriorities for either males or females, but were familiar core areas with fluid edges. Considerable overlap in ranges were observed in all sex and age classes. Round-the-clock activity monitoring showed that bears were active at all times of the day, and showed crepuscular tendencies only in summer. Summer activity peaks occurred at dawn and dusk. Spring and fall activity peaked at dusk. Bears exhibited no nocturnal activity in any season except limited early evening activity in the June -July breeding period. Habitat use by all bears coincided with major seasonal food sources. Wetlands were highly preferred in spring and early summer. Skunk cabbage (*Symplocarpus foetidus*) and grasses growing in wooded wetlands, constituted most of bears' early spring diet. Bears used abandoned fields, clearcuts, and other berry-producing areas in late summer. Hardwood stands were important in fall, as acorns and beechnuts were major fall food items. Wetland edges and "corridors" along streams were major travel routes in all seasons. Bears denned usually from mid-November to mid-April. Most dens (62.5%) were in slash piles left by logging operations.

Detailed findings are presented in the thesis, "Home Range, Movements, and Habitat Preferences of Black Bear in Western Massachusetts" by Kenneth D. Elowe.

FURBUYER TALLIES

A total of 27 furbuyers submitted annual reports; of these, nine did not buy any furs from Massachusetts trappers or hunters. The remaining 18 purchased 30,281 muskrat, 516 mink, 68 otter, 11 skunk, 6,585 raccoon, 75 fisher, 489 red fox, 214 gray fox, 313 beaver, 23 bobcat, 18 coyote, 138 opossum, and 4 weasels.

The results of four fur auctions held by the Bay State Trappers Association were tabulated to give a yearly average. The average prices for 1983-84 were muskrat $4.30, mink $22.40, otter $35.31, fisher $110.11, opossum $1.57, raccoon $10.84, red fox $41.45, gray fox $36.28, bobcat $50.92, beaver $16.26, and coyote $21.02.

MAST SURVEY

District offices surveyed their oak plots in August to determine acorn production. There were 90 permanent oak plots across the state consisting of 40 white oak plots (368 trees) and 50 red oak plots (482 trees). These plots were all surveyed during August to determine acorn production. In addition, a subjective mast report was distributed to interested volunteers throughout the state, to collect general data on a wide variety of wildlife food crops.

White oak production was a complete failure all across the state. Red oak production was much better although still a poor rating in every district except Northeast which had a failure. Cherry, blackberry, raspberry, blueberry, and crabapple seemed to produce well while production of all others was relatively low.

WILDLIFE DEVELOPMENT

The Development Project is responsible for operations on 52 Wildlife Management Areas, totaling 61,000 acres. The project also has responsibility for the construction, erection, and maintenance of nesting structures statewide.

The work done on wildlife management areas provides for public useage and safety and improves existing habitat for wildlife.

Below is a summary of work done between 1 July 1983 and 30 June 1984:

JOBS PROVIDING FOR PUBLIC USE

1. Buildings: Maintained 14 buildings on 7 areas.
2. Bridges: Maintained 2 bridges on 2 areas.
3. Roads and Trails: Constructed .7 miles of trail on 1 area and maintained 48 miles of roads and 17 miles of trails on 11 areas.
4. Parking Lots: Four lots were constructed on 1 area and 61 lots were maintained on 13 areas.
5. Blinds: Fifteen waterfowl blinds were maintained on 2 areas.
6. Signs and Boundary Markers: A total of 354 signs were erected on 9 areas and 11 miles of boundaries were marked on 4 areas. An additional 1,057 signs were repaired and maintained on 25 areas and 94 miles of boundaries were checked and reposted where needed on 25 areas.
7. Managed Public Hunts: Controlled hunts were held on 4 areas; two for waterfowl, one for upland game, and one for deer.
8. Gates: Thirteen gates were erected on 4 areas and 39 gates were maintained on 9 areas.
9. Building Removal: Seven abandoned buildings were removed from 1 area.

JOBS FOR IMPROVING WILDLIFE HABITAT

1. Dams: One dam was maintained.
2. Fences: Four miles of fences were maintained on 1 area.
3. Tree and Shrub Planting: Five areas had 600 shrubs and 1,025 trees planted for hedgerows and field border improvement.
4. Herbaceous Seedlings: Personnel planted and/or maintained fields by mowing or spreading lime and fertilizer. A total of 242 acres of fields were managed on 7 areas. In addition, 1,671 acres of fields on 19 areas were managed by cooperative agreements with local farmers.
5. Clearing: Nine acres were cleared on 1 area to create herbaceous habitat for bob-white quail.
6. Vegetation Control: Brush was controlled on 14 areas with a total of 222 acres being affected.

7. Timber Management: Two acres were cut selectively on 1 area.
8. Water Level Management: Water levels were manipulated on 1 area of 160 acres to encourage emergent vegetation.
9. Nesting Structures: A total of 166 wood duck nesting boxes were constructed for statewide distribution and 936 boxes were checked and repaired. Four osprey nesting platforms were constructed in southeastern Massachusetts, bringing the total number constructed under this program up to 15 platforms. Six loon nesting rafts were placed on Quabbin Reservoir. One-hundred bluebird nest boxes were constructed and distributed to the five wildlife districts for installation.

Additional time was spent by personnel in planning work, submitting reports, ordering supplies, maintaining equipment used on the project, inspecting ongoing work and checking each area.

GAME FARMS

E. Michael Pollack
Chief Game Biologist

During the 1982 and 1983 pheasant rearing season, all the game farms experienced a highly contagious viral disease causing a 50% or higher chick mortality.

The disease was finally identified by the University of Connecticut Wildlife Disease Department as "rotavirus." Mortality of the chicks occurred between 3-15 days and could not be controlled by any treatment.

Starting in the fall of 1983, all farms conducted a vigorous sanitary program; fumigated all equipment and buildings and closed farms to non-essential traffic, i.e., visitors. In addition, all broodstock was released and new broodstock acquired from New York State.

The results of a such a stringent program paid off as 1984 resulted in no evidence of rotavirus. Mortality to date has been normal.

Game Farm Production

1983

Pheasants

Game Farm	SR	B	C	PG	Totals
Ayer	1,795	1,436	3,892	10,408	17,531
Wilbraham	1,985	2,960	6,716	6,132	17,793
Sandwich	125	1,192	2,832	6,076	10,225
Totals	3,905	5,588	13,440	22,616	45,549
Quail					4,170

No white hare purchased due to poor trapping conditions in New Brunswick during winter of January-February 1984.

NON-GAME AND ENDANGERED SPECIES

Bradford G. Blodget
State Ornithologist

The Massachusetts Nongame and Endangered Species Program was first established by the Division of Fisheries and Wildlife in 1977. As a result of the passage of Chapter 330 of the Acts of 1983; often referred to as the Nongame Checkoff Bill (see legislative section), the Nongame and Endangered Species Program was able to expand its programs in Fiscal 1985. The program's full time staff now includes the Assistant Director for Nongame and Endangered Species, the State Ornithologist and Information Specialist. Checkoff funds first became available in the 1985 Fiscal Year so the program is expected to develop even further over the next year.

Another new development was the transfer of the Massachusetts Natural Heritage Program from the Department of Environmental Management to the Division of Fisheries and Wildlife. The Massachusetts Natural Heritage Program has been operated since 1978 cooperatively between the Commonwealth and The Nature Conservancy and, during this period, has primarily been funded from the General Fund through periodically renewed contracts. The Nongame and Endangered Species Program work closely together to identify and protect populations of rare plant and animal species and unique natural communities.

Passage of the Nongame Checkoff Bill was a Legislative landmark for the Nongame and Endangered Species Program. Versions of this bill had been debated by the state legislature since 1978. This law now provides a funding source for the Nongame and Endangered Species Program through a state income tax checkoff as well as through direct donations to the Nongame Wildlife Fund. All contributions are voluntary and will be federally tax deductable. These funds will be used for operation of the Nongame and Endangered Species Program, including nongame inventory, research, management, education, administration and land acquisition. The law also officially established a seven member Nongame Advisory Committee which replaced a similar Ad-Hoc Committee appointed by the Director in 1981.

As previously mentioned, the Massachusetts Natural Heritage Program was also transferred to the Division of Fisheries and Wildlife in Fiscal 1984 through the transfer of its line item in the state's budget. A total of 640 new records of rare plant and animal species and significant natural communities were added to the Massachusetts Natural Heritage Program's computerized data base during the year, bringing the total to 2,210 records by the end of June 1984. Although the Greenway Planning Program is budgeted in the same line item, this program will continue to be administered primarily by the Department of Environmental Management.

Restoration Projects

Bald Eagle

Four young eagle chicks which arrived from Manitoba, Canada in Fiscal 1983 successfully fledged from the hack tower at Quabbin Reservoir in Fiscal 1984. A film, "Home Free," based on the Division's efforts to raise and release these young eagles in 1983 was completed and will be released shortly.

During Fiscal 1984, six additional bald eagle chicks were brought to the Quabbin area from Cape Breton, Nova Scotia. Five of these birds fledged successfully in Fiscal 1985. The sixth chick died of an intestinal bacterial infection while being raised at the tower.

The annual Winter Bald Eagle Survey was held this year on January 7. As in the past, the greatest number of eagles, 17 bald and one golden, were seen at Quabbin Reservoir. Bald eagles were also reported from the lower Merrimack River (2), Nantucket (1), Assawompsett Pond (2), and the Connecticut River (3). The statewide totals were 25 bald eagles and one golden eagle.

Common Loon

During calendar 1983, restoration efforts continued in cooperation with the Metropolitan District Commission. Although six loon nesting rafts were put out at Quabbin, none were used by nesting loons. Five pairs of loons were known to have attempted nesting during the summer of 1983, but no chicks fledged.

During calendar 1984, a cooperative proposal with the Metropolitan District Commission and the Massachusetts Audubon Society was submitted to the North American Loon Fund. A $2,000.00 grant was awarded which provided stipends for two loon wardens. Nesting rafts were again put out in spring 1984, but none was used. Four pairs of terriotiral loons began nesting before the end of June.

Peregrine Falcons

Before the end of Fiscal 1984, preparations were made for the arrival of six young peregrine falcons from the Peregrine Fund's captive breeding facility at Cornell University in Ithaca, New York. A hacking site was selected on the roof of the federal J. W. McCormack Post Office and Court House Building in downtown Boston.

Two hack site attendants were hired prior to the arrival of the six chicks on July 17 (in Fiscal Year 1985).

Research Projects

Plymouth Red-bellied Turtle

Dr. Terry Graham of Worcester State College was awarded his third contract from the Division of Fisheries and Wildlife to conduct research on the distribution, population density and structure, and natural history of the Plymouth Red-bellied Turtle. His research was also designed to evaluate the chemical and biological parameters of ponds where the turtles are known to occur. Between July 1, 1983 and the end of September, 39 different individual red-bellied turtles were captured at Federal Pond, two at Crooked Pond and one at Dunham Pond. Foods of nine individuals at Federal Pond were analyzed.

A study of factors threatening recruitment into the existing population, including predation of eggs and young, environmental stress, and low egg production, resulted in several management recommendations. Data for turtle captures in spring 1984, and for the water quality parameters of the ponds for the entire fiscal year are still in preparation by Dr. Graham.

Inventory

Coastal Colonial Waterbird Survey

In spring 1984, the Nongame and Endangered Species Program initiated and coordinated a coastal colonial waterbird survey for the state. This survey was conducted in cooperation with the U. S. Fish and Wildlife Service, National Park Service, Trustees of Reservations, Massachusetts Audubon Society, and many private individuals. This survey is part of a complete east coast effort by the U. S. Fish and Wildlife Service to document the status of colonial waterbirds. The survey results will be completed in Fiscal 1985.

Terns

The 1984 annual tern census and inventory began in June. This will be the Eight Annual Tern Survey coordinated by the Division of Fisheries and Wildlife. Data will be available following the September meeting in Wellfleet. The 1983 report was issued in fall of 1983. Fifty colonies with a total of 7,909 pairs of Common Tern were recorded as were 18 pairs of Artic Tern, 1,502 pairs of Roseate Tern, and 2,112+ pairs of Least Tern. Seventy-plus pairs of Piping Plover were also recorded in association with 30 tern colonies. In 1984, Piping Plover were separately inventoried by the Massachusetts Natural Heritage Program.

Inland Great Blue Herons

With assistance from four cooperators, the Nongame and Endangered Species Program staff completed the 1983 survey of Great Blue Heron colonies. In 1983, 13 colonies were found to contain a total of 191 active nest platforms and produced approximately 500 young. By contrast, in 1979, six known colonies contained 28 active nests. The number of nesting Great Blue Herons known in Massachusetts continues to increase annually.

The 1984 survey was begun and results will be available later this fall.

Bats

Coordinated by Jim Cardoza of the Division Wildlife Research Section, the annual mid-winter bat survey was completed and the results were tabulated for the Chester emery mines. A total of 872 bats were reported in the Old Mine, including 153 little brown bats, 113 keen's bats, 15 eastern pipistvelles, and 591 unidentified myotis. The Macia mine contained 57 little brown bats, 90 keen's, 19 pipistvelles, and six myotis . Checks at other locations included the Tantiusques Mine in Sturbridge (3 little brown, 2 keen's) and Bat's Den Cove in Egremont (2 little brown, 11 pipistvelles).

Bog Turtle

Three gravid females were discovered in a unique calcareous fen in western Massachusetts in June 1984. This represents the first population of this rare reptile ever documented in Massachusetts. Only one previously documented specimen had been reported from the state. Continued inventory, research, and management is planned to insure the security of this newly discovered population.

Land Acquisition

During Fiscal 1984, nine properties in the state were identified for possible acquisition. In conjunction with the Massachusetts Natural Heritage Program, land acquisition priorities were designed to consider the global and

and state significance of the species and natural communities that are present and can be protected on a site. Negotiations are underway for two properties but no agreements have been reached as yet.

Staff and Budget

Staff Changes

In March 1984, Dr. Thomas French took over as Assistant Director for Nongame and Endangered Species and Brad Blodget assumed his former position as State Ornithologist. Joy Merzer began in January 1984 as a contracted Information Specialist for the program. Joy worked with Ellie Horwitz during Fiscal 1984 primarily on promotion for the Nongame Wildlife Fund.

These promotional efforts included preparation of public service announcements for television and radio, production of an award-winning brochure and a poster by Boston University's Ad Lab, numerous radio and television interviews by the Nongame and Endangered Species Program staff and Advisory Committee Members, and many other presentations around the state.

Other Affiliated Staff

The Nongame and Endangered Species Program continues to benefit from inventory and management efforts of staff in the Division's game section. Some of the primary contributions in Fiscal 1984 were from Bill Davis (osprey pole program, purple martin house program, bald eagle project, and others), Jim Cardoza (bat surveys), Jack Swedberg (bald eagle project), Bill Byrne (bald eagle project), Peter Mirick (reptile and amphibian issues). Dave Halliwell (nongame fish issues), Ellie Horwitz (program promotion and bat survey). Without the efforts of these staff members, many of the nongame projects of Fiscal 1984 could not have been accomplished.

Massachusetts Natural Heritage Program

Major research and inventory projects for rare animal species included grassland bird surveys; a coastal inventory of Piping Plover, American Oystercatcher, and Willet; contracts to outside researchers for the study of rare lepidoptera, rattlesnakes, and small mammals; and the organization of the third annual statewide salamander survey.

Highlights of botanical field work in Fiscal 1984 included the discovery of three rare native plant species never before seen in Massachusetts, and the rediscovery of a dozen rare species not seen in the state for the past 50 to 100 years.

A total of 851 projects from a variety of sources, including federal and state environmental regulatory processes, municipal governments, private conservation groups, and private consultants were reviewed by the staff during Fiscal 1984. Of these, 130 (15.4%) had rare species within their study areas, and comments were prepared for the appropriate agency to address potential mitigation or protection measures.

DISTRICT REPORTS

Northeast District, Walter L. Hoyt, District Wildlife Manager
Southeast District, Louis Hambly, District Wildlife Manager
Central District, G. Christopher Thurlow, District Wildlife Manager
Connecticut Valley District, Herman Covey, District Wildlife Manager
Western District, Tom Keefe, District Wildlife Manager

The wildlife districts are the operating field units of the Division of Fisheries and Wildlife working directly on Division properties, conducting field research under the supervision of project biologists and serving as liaison with sportsmen, conservation groups and the general public. During the 1984 fiscal year, personnel from all districts stocked trout, pheasants, and operated checking stations at which hunters checked in deer, turkeys and where trappers checked pelts. They assisted the Division of Law Enforcement in enforcing wildlife regulations and monitored controlled hunts at the Delaney Wildlife Management Area and Martin Burns Wildlife Management Area (Northeast), Otis Air Force Base (Southeast) and Ludlow Wildlife Management Area (Connecticut Valley).

A major focus of District activities was on habitat management on a variety of areas owned or managed by the Division. Activities in this area were concentrated on planting shrubs and grasses, liming acidic soils, fertilizing and cutting of brush and, where appropriate, timber. Farmer/cooperator agreements were redrawn as needed confirming private management activities which benefit wildlife primarily, but not exclusively, by cultivating and leaving food crops for wildlife. Special efforts in the

Central District involved preparation of wildlife lands in the recently acquired High Ridge Wildlife Management Area - where 12 old buildings were removed with the help of demoliiton specialists from the U. S. Army and a special planting program was undertaken under the Liberty Tree Program through which 2,000 trees and shrubs were planted, roads were brushed out and stream improvements were installed over a two month period. In the Southeast, habitat management efforts focussed primarily on established properties at the Crane Wildlife Management Area and on the Myles Standish State Forest.

While the primary thrust of activities on the management areas was for the improvement of wildlife habitat, other activities were carried out to benefit human users of the properties. In this regard, district crews improved roadways and parking areas and posted signs as needed.

District staff members also took part in such continuing research projects as waterfowl inventory and the mid-winter eagle survey. They conducted censuses of mourning dove (4 districts), woodcock (4 districts), took part in a statewide mast crop survey (3 districts) and counted quail (southeast district only). Staff members of the Connecticut Valley District were especially involved in work on the black bear research project being conducted through the University of Massachusetts, while members of the Western District staff worked closely with research personnel from Westboro and from the University on the wild turkey program. In this context, they scouted birds, made and maintained contact with landowners and assisted in trapping birds to be moved to other portions of the Commonwealth. Field crews assisted with the wood duck research program by putting up, cleaning and maintaining wood duck nesting boxes as needed; Northeast District personnel assisted in the inventory of great blue heron rookeries and the Southeast District staff did the same with houses for purple martins. Four martin houses were erected; forty were checked and serviced.

Staff from the Northeast District was involved in the continuing controversy over deer management on the Crane Reservation, Ipswich, a property of the Trustees of Reservations and the issue of waterfowl feeding vs. hunting along the Danvers River.

As in the past, District personnel responded to public inquiries, picked up injured animals and fielded complaints about nuisance animals by providing advice, loaning traps and where necessary, by moving beaver. During this year, the District staff members also took on additional activities as the Nongame and Endangered Species Program gathered momentum. Staff members from the Central District and the Connecticut Valley District continued to assist in the eagle restoration project at Quabbin.

Fisheries staff members of all districts were heavily involved in monitoring water chemistries of selected ponds and streams to determine species composition of fish populations, growth rates and productivity of the waters. Special emphasis was placed on examining the pH of these waters in the Commonwealth. Mitigation measures (liming) were undertaken on Sandy Pond, Fresh Pond and College Pond, Plymouth; surveys were conducted at Waldo Pond, Brockton; Assawompsett Pond, Lakeville; and 10 streams. Permission to undertake liming operations was denied by local Conservation Commissions for Schoolhouse Pond, Chatham; Bakers Pond, Orleans; and Great Pond, Truro.

The fisheries staff participated in fisheries and acid rain surveys as needed and in projects specialized to their area. This brought staff from the Northeast District to the Essex Dam where they assisted in monitoring and operating the fishlift. The Northeast District finally closed the former Harold Parker State Forest bass rearing facility -- inoperative for many years -- and the ponds, formerly closed, were reopened to public fishing as were the ponds of the Southeast's Rochester Rearing System. Staff of the Connecticut Valley District and Central District gathered fish for the young eagles being raised at Quabbin. Southeast District assisted in efforts to improve the Mattapoisett River for the sea-run brown trout fishery.

In the Connecticut Valley, district personnel were involved with the beginnings of a program to improve fish habitat on the upper portion of the Swift River. Two local sportsmen's clubs had raised $1000.00 each. This, with matching funds from T.U.'s Mellon Foundation, provided $6000.00 for the program. Division crews joined volunteers in developing a trail and constructing wing deflectors, a foot bridge and half-log covers which were placed in two-three feet of water as escape cover topsoil and were seeded. This program is expected to vastly improve fishing on the Swift River below the Winsor Dam in Belchertown.

Time not spent in the above-mentioned activities was spent in technical review of a wide assortment of projects derived to have a possible impact on fisheries or wildlife, in technical assistance and in maintenance of vehicles, facilities and wildlife management areas.

District staff members distributed hunting/fishing licenses and related stamps, regulations and informational material to over 450 license sales outlets, and picked up sales returns from the same. Personnel from most districts participated in one or major exhibits helping to make the Division and its activities more visible to the general public and respond to inquiries from the sporting public. In addition to doing this at exhibits, such as the Eastern States Exposition, the Eastern Fishing Exposition, the Boston Camping and Outdoor Show and the Topsfield Fair, staff members presented programs for clubs, civic organizations, sportsmen's groups, and school groups as possible.

SPECIAL NOTE OF APPRECIATION

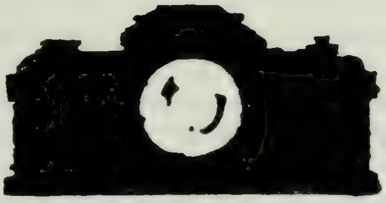
While District crews met and dealt with a wide variety of events and conditions, one deserves a special note as fast staff action averted a crisis at the Division's largest hatchery.

After a long wet period and an extended rain on the evening of May 30-31nd with rising waters of the Swift River about to drown the main pump house at the McLaughlin Hatchery, the decision was made to evacuate the entire station. Water was rising at 1.5 inches per hour and it became necessary to pull the main switch and shut off all power. All staff of the Connecticut Valley District were called to meet the emergency and to assist hatchery personnel in the transfer of over 500,000 trout. Adult trout went to Sunderland while fingerlings went to the Palmer Station. Show pool fish were released into Quabbin. The call back started at 8:00pm and the men remained on the job until noon the following day.

The dedication shown by all involved warrants a special vote of thanks.

STOCKING

	NORTHEAST		SOUTHEAST	CENTRAL	CONN. VALLEY	WESTERN
Trout	189,355		141,590 15,000	144,500 7,500	155,387	207,208
Pheasant	4,800	cocks hens	8,476 1,910	12,400 2,250 1,395	10,396	4,476 1,620
Quail			4,170			
Hare					147	
Salmon				10,000		
Tiger Muskie				10,000		



INFORMATION & EDUCATION

Ellie Horwitz
Chief
Information and Education

Press Contacts

The growth in press coverage noted in Fiscal Year 1983 continued through Fiscal Year 1984 with the section issuing 22 press release packets comprising 130 actual release items. These releases were mailed to an average of 1,700 outlets including newspapers, radio/TV stations, sportsmen's clubs, conservation organizations, town clerks and sporting goods stores. Press response to the releases continued to increase and an analysis of clippings for the calendar year 1983 showed that Massachusetts Division of Fisheries and Wildlife material was being used on an average of 240 times per month with nine months showing a rate of clipping returns considered "prime" (200+).

In addition to issuing releases, the section hosted ten special events including a press tour of the eagle hacking site at Quabbin which drew 54 writers and television representatives; dedication of the Roger Reed Hatchery, Palmer; signing of a proclamation establishing National Hunting and Fishing Day in Massachusetts; dedication of the trout hatchery at Podick Springs; release of wild turkeys in Groton (2); a press day in the field with the bear research team; a press event focussing on transport of a bald eagle which had been found shot, from a South Shore veterinary facility to NRO Thomas Ricardi; a general information day for outdoor writers and a press conference for the Nongame Fund. A special series of articles, one per month, on Division activities was prepared for the Outdoor Message at their request by Peter Mirick for a period of three months.

Special attention was focussed on working with staff of the Trustees of Reservations to develop public and press advisory materials and procedures to be used in a program to reduce the deer population on the Trustees' Crane property through a controlled hunt. The proposed hunt was cancelled by the Trustees less than 24 hours before the hunt was to begin, plunging information staff into a program of calling prospective hunters, alerting all press outlets and providing information to a much surprised press corps.

The radio show, pioneered with WDLW, continued with a fall radio series of 13 weeks of three one minute shows aired six times a week and broadcast from September through January. As a commercial sponsor purchased broadcasting time, these spots were aired during morning and evening drive times.

In addition to these programs, the Division responded to direct inquiries for information and materials from print and electronic journalists.

Private citizens also sought out the Division for answers to questions regarding natural history, wildlife research programs, Division policies, public lands, vacation planning, etc. To meet those needs, the Information and Education Section mailed out more than 10,000 items (maps, permit applications, regulations, publications) and provided personal written responses as needed.

Publications

Many inquiries were answered with Division publications. As always, all annual publications (regulations, stocking lists, fishing access information, lists of towns having special hunting regulations, and other routine publications) were updated. The Boston Herald agreed to publish a sportsmen's calendar using information supplied by the Division, and the Boston Globe continued to print the joint Globe/Division fishing guide.

In addition, the section joined forces with the University of Massachusetts in planning and preparing two series of flyers, one on Natural History and one on Animal Damage Control which was subsequently printed by the Cooperative Extension Service. In all, 11 leaflets were issued.

Massachusetts Wildlife continued to operate at a reduced level. In view of the launching of the Nongame Wildlife Fund, section staff determined to devote the year's one issue to a celebration of the Nongame Program -- an issue which was very well received. At the same time, Editors Mirick and Horwitz continued to explore options to make the magazine self-supporting. An outline of projected production and promotional costs was developed to assist Director Cronin in his negotiations to establish a separate fund for the magazine. This was considered necessary to enable the magazine to meet its expanding obligations once it moves to a subscription basis.

Exhibits

As in other years, the Information and Education and District staff participated in a series of shows and fairs to increase Division visibility and to facilitate communication with members of the general public. During 1983-1984, the exhibit subject combined warmwater fish and fishing with wildlife research, represented in the exhibit by a bobcat. Information and Education staff worked closely with District personnel to prepare live-animal exhibits and related materials for the Eastern States Exposition, Springfield; the Eastern Fishing Exposition, Boxborough and the newly established Springfield Sportsman's Show. In addition to these major shows, smaller exhibits were established and staffed at the Greenfield and Topsfield Fairs. Table-top display units were purchased to assist in meeting needs for display material for one and two day shows throughout the Commonwealth.

Programs

All members of the section participated in presenting slide and film shows to both technical groups and general audiences. While this year saw a heavy emphasis on shows explaining the nongame program, other popular programs involved wildlife in Massachusetts' turkey restoration, Division activities and programs designed specifically for the particular audience. These groups included school groups, garden, sportsmen and civic clubs, senior citizens, church groups, etc. In addition to presenting such programs as possible, the section's photography staff created slides to enhance programs given by biologists and District personnel.

Photography

Division photographers continued to document Division-related wildlife activities on film to increase the Division's library of still photos and film footage. Photographers Swedberg and Byrne worked closely with members of the Nongame staff to produce a slide show on the Nongame Program. This program, prepared as a coordinated slide tape production in both 25 minute and 10 minute versions has been extremely popular with groups seeking information and entertainment. As additional photographs were generated, a problem arose in developing a system, long neglected, whereby photographs could be organized in an efficient manner to make them accessible to Division staff. Volunteer Anne Youngstrom worked with the photographers to revitalize the system currently in use and to update photography files.

Education

In addition to general school programs mentioned under "Programs" and the instruction provided at the Massachusetts Junior Conservation Camp, special programs were offered to Ducks Unlimited's Greenwings, and to two sessions of Project Adventure, an enrichment program of the Westboro schools. A workshop for teachers on teaching about wildlife was held at the request of the Concord Public School System and conversations with the Audubon Society continued on the subject of Massachusetts' involvement in Project WILD.

Special Programs

Nongame Promotion

Unquestionably, the single most important "special project" addressed by the Information and Education Section during the period was the preparation of material for and launching the first campaign to obtain contributions to the newly established Nongame Wildlife Fund. The Fund, and a checkoff provision on the Massachusetts Income Tax to generate donations was established by the Massachusetts Legislature and signed into law by Governor Michael S. Dukakis on July 26, 1983. Shortly thereafter, plans were initiated to develop promotional materials. Some 35 groups with wildlife related programs were solicited to co-sponsor the new program and to assist with distribution of promotional material. Donations were solicited to allow the printing of these promotional materials and funds were received from the Massachusetts Audubon Society, the Sierra Club and the Middlesex County League of Sportsmen's Clubs. A crash course in basic advertising was provided to section Chief Ellie Horwitz by faculty members of Emerson College and Boston University. This latter institution also offered the services of a group of young advertising pre-professionals through AdLab, a senior and graduate seminar in advertising. The AdLab team worked with Division staff to prepare basic promotional material including a poster, a program brochure, small cards for general distribution and a print ad using the slogan "Line 36B is for the birds. . ." Press releases were issued to introduce the program, special releases were generated to assist legislators in promoting the program among their constituents and special press packages were created to meet press demand for information about the new program and about specific individual projects. Fifteen, 30 and 60 second radio spot announcements were developed and Ellie Horwitz worked with Channel 5 in the production of a 30 second television spot. Efforts were made to solicit the services of a special spokesman - contacts were made with Bill Cosby, Larry Bird and Big Bird (Carroll Henderson). In all cases, arrangements proved impossible in view of the limited time frame.

Once initial plans had been established and print materials were in preparation, effort was turned to distribution of posters and brochures. Posters were placed in town clerks' offices, tax preparer's offices, in libraries and in veterinary offices. Brochures were available at all of these outlets as well as at offices of affiliated groups and at meetings of clubs and organizations. Appearances for program director Dr. Thomas French and for Commissioner Walter Bickford were booked on all major television stations and many radio stations. Additional radio appearances were made by other members of the Nongame staff and by members of the Nongame Advisory Committee. The task of generating these bookings and monitoring the use of radio/TV materials was taken on in January by Joy Merzer who joined the staff as Information Consultant for the Nongame Program. By the end of June, this program had netted $388,070.00.

Freshwater Fishing Awards

Four hundred and seventy-five applications were received for recognition under this program. Annual winners were recognized in a special awards ceremony held at the Eastern Fishing Exposition. New state records were set for American shad and carp. The Tags 'n' Trout program, sponsored cooperatively by the Division and numerous civic groups, clubs and sporting businesses placed 375 fish in 15 bodies of water. Tag return rates were 60% and, at the conclusion of the program in September, 100% of the participating groups sent in the requested reporting materials.

Conservation Camp

The section continued in its traditional role which involves pre-camp administration, publicity and general record keeping. To facilitate this and for the convenience of the camp nurse, a new health record form was prepared. Publicity for the camp was woven into numerous Division shows and press releases. Special publicity for the camp was offered through a special display at the Framingham Sportsmen's Show and through the development of a slide set showing camp activities. Once camp opened, section staff joined other Division staff as instructors. Section staff also prepared and administered a final examination and took part in graduation ceremonies.

Waterfowl Stamps

The stamp program, now into its 11th year, drew 67 entries to the Peabody Museum of Salem. The winning painting was a white winged scoter carved by Captain Samuel Fabens and painted by Joseph Cibula of Marstons Mills.

Archery/Primitive Firearms Stamp

This year, for the first time, sportsmen hunting with historic firearms during the three day "primitive/firearms/deer season" were required to purchase the same stamp used by bowhunters earlier in the year. The design for the stamp was prepared on commission by Graphic Artist David Gabriel of Dorchester.

Wildlife Projects

Information and Education staff members continued their active participation in the Division's wildlife research and management programs in many ways. Both Jack Swedberg and Bill Byrne continued their active role in the Eagle Restoration Program with Jack especially involved as Restoration Project Leader. Peter Mirick continued to coordinate the Division portion of the statewide breeding salamander survey and to serve as Division Herpetologist. Ellie Horwitz continued to participate in the statewide bat inventory.

Other

In addition to the aforementioned activities, section staff members participated in many other programs and projects. The annual deer season hotline was in operation throughout deer season and hunters taking noteworthy deer were offered attractive commemorative certificates. Early sale of licenses was encouraged by the preparation of Christmas gift envelopes and a Christmas gift campaign.

Staff members Horwitz, Mirick and Swedberg were active participants in the New England Outdoor Writers. Horwitz and Mirick served that group as Chairmen of the Annual Awards Committee.

REALTY

Floyd Richardson
Chief of Wildlife Lands

The enactment of Chapter 723 Acts of 1984 can only be described as land-mark legislation. Capital outlay monies totalling 162 million dollars to acquire, preserve and protect open space became the responsibility of seven state agencies.

Fiscal Year '84 also ushered in the Nongame Tax Checkoff bill. A portion of the funds collected under this program would be for the specific purpose of acquiring rare, threatened or endangered species habitat.

The planning, accountability and responsibility for the implementation of this environmentally important program rests with the Realty Section. The new dimension created by the multiple funding sources presents new challenges. The implementation and committal of funds which will follow will benefit all having a genuine interest in the great out-of-doors.

Millers River Acquisition Project 2,067.3 acres

One hundred and thirty-five (135) acres of exceptional wildlife lands add significantly to this management area. The newly acquired parcel is fringed with a wetland marsh on its western perimeter. Stockwell Road, its northern boundary provides access and off-road parking, while the eastern and southern boundaries abut other Division lands. Mixed hardwoods and softwoods offer habitat for deer, turkey, varying hare, grouse and other game species. The acquired parcel, once a flourishing farm, bears apple trees, grape-vine tangles, wild raspberry bushes, and stone walls. These elements benefit all species of wildlife.

Gardner Acquisition Project 1,783.7 acres

The management and control of the former Gardner State Hospital lands was transferred to the Division of Fisheries and Wildlife. Rolling hillsides, open meadows, forestlands and marshland blend together to provide a promising wildlife management area.

Two adjoining parcels were acquired to enlarge the area by an additional 110 acres. These parcels contribute both forest lands and open lands adjacent to Smith Street.

Bitzer Trout Hatchery 150.6 acres

This hatchery, long known as the Montague Trout Hatchery, produces excellent, large, "line-busting" trout. Water quality is one of the contributing factors responsible for the hatchery's success.

A proposed residential development site directly opposite the hatchery was made known to the Division. The development site was perched directly over an acquifer which is the water supply for the hatchery.

The imminent threat of water pollution caused by the proposed development and the potentially disasterous affect it would have on the hatchery, united sportsmen, town officials, and the Connecticut River Watershed Council and this agency. The concern of these groups immediately spawned action.

The Connecticut River Watershed Council opted to purchase the property then convey the property to the Division when funds became available. Sportsmen held raffles and received donations specifically for the acquisition and assisted in its purchase.

Subsequently, title to the property was recorded in the name of the Commonwealth February 14, 1984.

The Division of Fisheries and Wildlife is most grateful to the sportsmen, the Montague town officials, the Connecticut River Watershed Council and others too numerous to mention in this report who responded so enthusiastically and generously thereby averting contamination of an extremely important water resource.

Hinsdale Flats Acquisition Project 1,147.7 acres

The Hinsdale Flats has matured into a wildlife area that has sensitive habitat for numerous wild species of plants and animals. It plays host to every indigenous species of game in Massachusetts. In addition, it provides a challenging and well-known trout stream.

This year two parcels were purchased to add another 85 acres to the area. The larger parcel provides shoreline on Muddy Pond. The second parcel is situated northerly of Bullards Cross-Road adding frontage on Cady Brook. Both parcels contribute wildlife food and cover to the management area.

Bolton Flats Acquisition Project 734.4 acres

Fronting Route 110 in the township of Lancaster, this newly acquired 15 acre addition adjoins one of the more popular wildlife management areas. The new addition, with its dense cover and rich soils, provides ideal woodcock habitat.

Moose Hill Acquisition Project 509.5 acres

A small but important parcel of wildlife land recently acquired enlarges and provides protection for this wildlife area. Twelve (12) acres of woodland gently slope downward in an easterly direction to combine with a wetlands area. Mature oak trees growing throughout the parcel provide mast, a valuable wildlife food.

Phillipston Acquisition Project 2,929.5 acres

Consisting of woodland and abutting a beaver swamp, this parcel will significantly contribute to the wildlife community. The above-mentioned marsh is noted for the several successful wood duck nests prevalent throughout the flowage. The Cushing's gift is gratefully accepted. The Cushing Family of Gardner were most generous and sympathetic to wildlife by deeding 130 acres of wildlife land to the Division.

SUMMARY OF LAND ACQUISITION

Fiscal Year 1984

Area Name	Town	Acreage
Millers River	Royalston	135.0
High Ridge	Gardner	110.0
Bitzer Hatchery	Montague	10.0
Bolton Flats	Lancaster	15.0
Moose Hill	Paxton	12.0
Hinsdale Flats	Hinsdale	45.7
Phillipston	Phillipston	135.0
	TOTAL:	496.7

Maintenance & Development

John P. Sheppard
Chief
Maintenance and Development

Hatcheries

Contracts were awarded and work began on construction of a wastewater treatment facility at the McLaughlin Hatchery, Belchertown, which will process waste-laden waters from the raceways prior to discharging them into the Swift River. A new flow monitoring system was installed at that same hatchery to ensure consistent conditions for the trout. Existing wells were redeveloped at the Sandwich and East Sandwich Hatcheries to improve water supply and a contract was let out to do the same for an existing well at the Sunderland Hatchery and to install a new water supply line. Development at the Palmer Hatchery, plagued with vandalism, involved relocating the existing fence to move visitors further away from tanks and raceways.

Districts

A major reconstruction of existing roadway and parking facilities was completed at the District Headquarters in Belchertown and improvements were made on the residence at the station. Additional paving of road and driveway was completed at the Western District Headquarters in Pittsfield.

Field Headquarters - Westboro

New floor coverings were installed on both first and second floors giving the facility a more "finished" appearance. Three free-standing glass cases were built and installed in the McDonough Wildlife Museum leaving a need for only one case -- to house the fishing rod collection.

Hunter Safety Facility (Gardner)

This facility is just coming on line and extensive work is required to make the existing building serviceable. During this year, storm windows were installed as were an oil burner and a hot water unit. A contract for vinyl siding of the building was issued and awarded.

Public Access Facilities

Four areas received engineering attention during Fiscal Year 1984. A new canoe and cartop boat access was designed and built along the Hockomock River, Bridgewater. A new concrete slab, walls, concrete pads and wooden post barriers were constructed and installed at Fort Pond, Lancaster. This completes construction of the access facility at the pond. A new retaining wall was built and the existing roadway was reconstructed at White Pond in Concord. This now complete facility offers improved access and additional parking facilities.

Another parking facility with a wooden post perimeter was completed at Webster Lake, Webster in initiation of a revision of the public access facility. Design work was also completed for a new ramp, concrete slab and wall at Webster Lake and contracts for the work have been awarded.

PERSONNEL ACTIONS

Thirty-five personnel changes were undertaken during this fiscal year. They are:

Retirements

Name	Job Title	Date
G. Kuczma	Assistant Fish Culturist	08-26-83
W. Neale	Wildlife Mgmt. Area Supervisor	08-17-83
P. DeMarco	Conservation Skilled Helper	05-27-84
J. Maslanka	Conservation Skilled Helper	12-31-83
R. F. Deane	Conservation Helper	03-31-84
A. Kleinot	Principal Bookkeeper	06-30-84

Resignations

M. Pottle	Junior Clerk & Typist	09-30-83
R. Mietta	Conservation Skilled Helper	11-26-83
C. Croken	Senior Clerk & Stenographer	12-31-83

Appointments

Name	Job Title	Date
J. Hazzard	Conservation Helper	07-17-83
J. Kerr	Conservation Helper	08-28-83
W. MacCallum	Assistant Director - Wildlife	09-08-83
M. LaFleur	Junior Clerk & Typist	09-25-83
J. F. Williams	Assistant Fish Culturist	10-09-83
R. Lucas	Conservation Helper	11-27-83
R. E. Taylor	Assistant Fish Culturist	01-08-84
J. Shampang	Conservation Helper	04-29-84
T. W. French	Assistant Director for Nongame & Endangered Species	03-05-84

Promotions

D. Carlson	Wildlife Mgmt. Area Supervisor	10-02-83
R. Thomasian	Conservation Skilled Helper	10-02-83
N. Limosani	Principal Clerk	10-01-83
C. Croken	Senior Clerk & Stenographer	12-31-83
P. Sutliff	Senior Bookkeeper	10-02-83
M. Marenghi	Senior Clerk	10-02-83
A. M. Akin	Game Bird Culturist	12-04-83
J. S. Gromaski	Conservation Skilled Helper	02-26-84
S. Foster	Assistant Game Culturist	03-11-84
M. Wrubel	Conservation Skilled Helper	07-01-84
K. Weaver	Conservation Skilled Helper	10-02-83

Other

C. Ayers	Conservation Helper from Conservation Skilled Helper	10-02-83
B. Blodget	State Ornithologist	04-08-84

Positions Deleted

Junior Clerk & Stenographer, Grade 5, Boston Office

Senior Clerk & Typist, Grade 7, Boston Office

Staffing Pattern Change

Right of Way Negotiator to Wildlife Restoration Project Field Agent	08-14-83
Conservation Helper to Senior Bookkeeper	09-14-83

LEGISLATION

Enacted During Fiscal Year 1984

Chapter 330 - Acts of 1983. An Act Establishing the Nongame Wildlife Fund Along with the Nongame Advisory Committee and Authorizing Income Tax Refunds to be Credited to the Nongame Wildlife Fund.

Chapter 516 - Acts of 1983. An Act Defining "Firearm" and Regulating Ownership, Possession or Carrying of a Sawed Off Shotgun.

Chapter 538 - Acts of 1983. An Act Increasing the Surety Bond Required of Persons Authorized to Issue Licenses for the Division of Fisheries and Wildlife from $2000.00 to $6000.00.

Chapter 610 - Acts of 1983. An Act Authorizing and Directing Massachusetts to Join With the States of Connecticut, New Hampshire and Vermont along with the U. S. Fish and Wildlife Service and the National Marine Fisheries Service in a Common Compact for Management of the Salmon in the Connecticut River.

Chapter 617 - Acts of 1983. An Act Authorizing the Granting of an Easement Over Lands of the Division of Fisheries and Wildlife in Middleboro to William Couto for the Purpose of Installing an Electric Power Line to the Couto Cranberry Bogs.

Chapter 656 - Acts of 1983. An Act Designating a certain Section of the Lake Quinsigamond Bridge in the Town of Shrewsbury, in Honor of Kenneth F. Burns, a late member of the Division of Fisheries and Wildlife Board.

Chapter 658 - Acts of 1983. An Act Regulating the Interbasin Transfer of Water by the Water Resources Commission.

FINANCIAL REPORT

"HOW THE SPORTSMEN'S DOLLAR WAS SPENT"

	Account No.	Expenditures		Percentage
Administration				
Administration	2310-0200	$ 468,455.51		
Information-Education	2310-0200	232,199.12	$ 700,654.63	11.34%
Wildlife Programs				
Game Farms	2310-0400	675,589.62		
Wildlife Management**	2310-0400	756,195.77		
Wildlife Cooperative Unit	2310-0400	72,000.00	1,503,785.39	24.33%
Fisheries Programs				
Fish Hatcheries	2310-0400	830,818.99		
Fisheries Management**	2310-0400	644,554.93		
Fisheries Cooperative Unit	2310-0400	72,000.00	1,547,373.92	25.04%
Nongame and Endangered Species Program				
Admin., Mgmt. and Research**	2315-0100		20,743.08	.34%
Construction				
Development and Improvement of Facilities for Public Use*	2310-0300		44,326.15	.72%
Land Acquisition				
Acquisition of Upland Areas & Inholding on Existing Areas*	2310-0310		140,359.30	2.27%
Equipment				
Purchase of Equipment	2310-0315		262,556.01	4.25%
Dept. of Fisheries, Wildlife, and Recreational Vehicles				
Natural Resource Officers' Salaries and Expenses (15%)	2350-0100		301,511.31	4.88%
Hunter Safety Training***	2350-0101		145,358.96	2.35%
Transfers from Fund				
Group Insurance	1590-1007		533,066.00	8.62%
Salary Adjustments	2310-7001		221,822.36	3.59%
Pension Reserve Fund			181,924.00	2.94%
Retirement Assessment (.2%)	0612-1000		338,026.42	5.47%
Interest on Bonded Debt	0699-2800		44,592.50	.72%
Maturing Serial Bonds & Notes	0699-2900		194,000.00	3.14%
Total Expenditures			$6,180,100.03	100.00%

* Continuing Appropriation
** Portions of expenditures 60% or 75% reimbursable by Federal Government
*** 100% reimbursable by Federal Government

APPROPRIATIONS AND EXPENDITURES
Fiscal Year July 1, 1983 to June 30, 1984

Inland Fish and Game Fund Accounts

Account No.		Appropriations	Expenditures & Liabilities	Total Reversions
2310-0200	Administration	711,309.58	700,654.63	10,654.95
2310-0315	Purchase of Equipment	274,000.00	262,556.01	11,443.99
2310-0400	Wildlife Management	3,065,246.36	3,051,159.31	14,087.05
2315-0100*	Nongame Mgmt. & Research	22,740.50	20,743.08	1,997.42
		4,073,296.44	4,035,113.03	38,183.41

		Continuing Appropriations	Expenditures	Balance Forward
2310-0300	Development & Improvement of Facilities-Public Use	107,374.25	44,326.15	63,048.10
2310-0310	Acquisition Upland Areas; Inholding on Existing Areas	298,608.75	140,359.30	158,249.45
		405,983.00	184,685.45	221,297.55

		Capital Outlay Appropriation	Expenditures	Balance Forward
2670-9016	Acquisition of Coastal & Inland Wetlands	5,545.49		5,545.49

General Fund Accounts

Account No.		Appropriations	Expenditures & Liabilities	Total Reversions
2310-0500	Natural Heritage & Greenway Planning	155,000.00	144,197.34	10,802.66
2310-0550	Acid Rain Investigation	50,000.00	47,350.00	2,650.00
2315-0100*	Nongame Mgmt. & Research	22,740.50	20,743.08	1,997.42
		227,740.50	212,290.42	15,450.08

		Capital Outlay Appropriations	Expenditures	Balance Forward
2310-8821	Wastewater Treatment Facility, McLaughlin Hatchery (Alloc. of 2310-8827)	750,000.00	21,807.23	728,192.77
2310-8840	Acquisition of Cold Water Streams for Conservation & Recreation	3,760,000.00	-	3,760,000.00
2310-8841	Associated Costs (2310-8840)	240,000.00	-	240,000.00
2310-8842	Acquisition of Land to Existing Wildlife Management Areas	7,050,000.00	-	7,050,000.00
2310-8843	Associated Costs (2310-8842)	450,000.00	-	450,000.00
		12,250,000.00	21,807.23	12,228,192.77

*Nongame Mgmt. & Research expenses were funded by the Inland Fish and Game and General Funds (50% each).

SUMMARY OF REVENUE CREDITED
TO THE
INLAND FISH AND GAME FUND
July 1, 1983 to June 30, 1984

Collected by Agency:		
Fishing, Hunting and Trapping Licenses*	3304-61-01-40	$3,458,720.50
Archery Stamps*	3304-61-01-40	103,313.80
Trap Registrations*	3304-61-01-40	1,205.00
Waterfowl Stamps*	3304-40-01-40	6,562.40
Waterfowl Stamps - Ducks Unlimited*	3304-40-02-40	19,784.00
Special Licenses, Tags & Posters**		14,446.55
Antlerless Deer Permits	3304-61-14-40	39,662.50
Bear Permits	3304-61-14-40	3,440.00
Turkey Permits	3304-61-14-40	12,613.00
Rents	3304-63-01-40	16,524.90
Sales, Other	3304-64-99-40	21,410.80
Refunds Prior Year	3304-69-01-40	3,573.05
Miscellaneous Income	3304-69-99-40	1,113.45
		$3,702,369.95
Collected by State Treasurer:		
Fines and Penalties	3308-41-01-40	30,385.22
Interest and Discount on Revenue	3395-60-01-40	58,916.47
		$89,301.69
Federal Aid Reimbursements:		
Pittman-Robertson Federal Aid	3304-67-01-40	686,792.32
Dingell-Johnson Federal Aid	3304-67-02-40	344,195.97
Anadromous Fish Projects-Federal Aid	3304-67-04-40	16,346.28
Endangered Species Federal Aid	3304-67-11-40	3,633.55
Indirect Cost Reimbursement	3304-67-67-40	359,369.67
		$1,410,337.79
Taxes:		
Gasoline Tax Apportionment	3312-05-01-40	374,304.00
Transfers from General Fund:		
Salary Adjustments	3360-95-02-36	231,978.36
Reimbursement on Half Price Licenses	3360-95-08-40	75,132.25
		$307,110.61
Reversions:		
Accounts Payable		50,407.40
TOTAL REVENUE		$5,933,831.44

* See Detail Sheet #1
** See Detail Sheet #2

Detail Sheet #1

DIVISION OF FISHERIES AND WILDLIFE
RECEIPTS FROM FISHING, HUNTING AND TRAPPING LICENSES
Fiscal Year July 1, 1983 to June 30, 1984

Class & Type of License	Unit Price	Quantity	Gross Amount	Fees Retained by City/Town Clerks	Net Returned to Commonwealth
01 Res. Cit. Fishing	12.50	119,899	1,498,737.50	40,554.00	1,458,183.50
02 Res. Cit. Hunting	12.50	46,219	577,737.50	18,232.50	559,505.00
03 Res. Cit. Sporting	19.50	55,581	1,083,829.50	20,132.00	1,063,697.50
04 Res. Cit. Minor Fishing	6.50	7,263	47,209.50	2,703.25	44,506.25
05 Res. Alien Fishing	14.50	1,026	14,877.00	396.00	14,481.00
06 Non-Res. Cit./Alien Fishing	17.50	5,118	89,565.00	1,804.00	87,761.00
07 Non-Res. Cit./Alien Fishing (7 da.)	11.50	2,303	26,484.50	706.50	25,778.00
08 Non-Res. Cit./Alien Hunting (Small Game)	23.50	985	23,147.50	406.50	22,741.00
09 Non-Res. Cit./Alien C.S.P. (3 da.)	19.50	31	604.50	13.50	591.00
10 Res. Cit. Minor Trapping	8.50	177	1,504.50	73.00	1,431.50
11 Res. Cit. Trapping	20.50	808	16,564.00	347.50	16,216.50
12 Duplicates	2.00	3,260	6,520.00	-	6,520.00
13 Res. Alien Hunting	19.50	1,130	22,035.00	476.50	21,558.50
14 Non-Res. Cit./Alien Hunting (Big Game)	48.50	1,286	62,371.00	542.00	61,829.00
15 Res. Cit. Sporting (Over 70)	FREE	18,785			
16 Res. Cit. Fishing (Blind-Para-Ment. Ret.)	FREE	1,298			
17 Res. Cit. Hunting (Paraplegic)	FREE	124			
18 Res. Cit. Fishing (Age 65-69)	6.25	5,930	37,062.50	2,637.00	34,425.50
19 Res. Cit. Hunting (Age 65-69)	6.25	703	4,393.75	328.50	4,065.25
20 Res. Cit. Sporting (Age 65-69)	9.75	2,805	27,348.75	1,251.50	26,097.25
21 Res. Cit. Trapping (Age 65-69)	10.25	67	686.75	32.00	654.75
24 Non-Res. Trapping	300.00	2	600.00	-	600.00
		274,800	3,541,278.75	90,636.25	3,450,642.50
22 Archery/Primitive Firearms Stamps	5.10	20,567	104,891.70	1,585.90	103,305.80
Sold to Collectors			8.00	-	8.00
*Trap Registrations			1,205.00	-	1,205.00
Collections on Delinquent Accounts			8,078.00	-	8,078.00
		295,367	3,655,461.45	92,222.15	3,563,239.30
23 Waterfowl Stamps	1.25	23,354	29,192.50	4,523.75	24,668.75
Sold to Collectors			1,677.65	-	1,677.65
		318,721	3,686,331.60	96,745.90	3,589,585.70

*Trap Registrations:

Initials	79 @ $2.00	158.00
Renewals	698 @ $1.50	1,047.00
		1,205.00

Detail Sheet #2

SPECIAL LICENSES, TAGS AND POSTERS
July 1, 1983 to June 30, 1984

Receipt Account	Type of License	Quantity & Unit Price	Amount	Receipt Account Total
3304-61-02-40	Fur Buyers			
	Resident Citizens:	22 @ 25.00	550.00	
	Non-Residents or Aliens:	4 @ 75.00	300.00	850.00
3304-61-03-40	Taxidermists	89 @ 20.00		1,780.00
3304-61-04-40	Propagators			
	Special Purpose Permits:	32 @ 1.00	32.00	
	Class 1 (Fish)			
	Initials:	47 @ 15.00	705.00	
	Renewals:	165 @ 10.00	1,650.00	
	Class 3 (Fish)			
	Initials:	11 @ 15.00	165.00	
	Renewals:	74 @ 10.00	740.00	
	Class 4 (Birds, Reptiles, Mammals)			
	Initials:	47 @ 15.00	705.00	
	Renewals:	321 @ 10.00	3,210.00	
	Class 6 (Dealers)			
	Initials:	8 @ 15.00	120.00	
	Renewals:	56 @ 10.00	560.00	
	Additional Stores:	108 @ 5.00	540.00	
	Class 7(Individual Bird or Mammal)			
	Initials:	2 @ 5.00	10.00	
	Renewals:	29 @ 2.00	58.00	
	Importation Permits			
	Fish:	2 @ 7.50	15.00	
	Birds:	30 @ 7.50	225.00	
	Class 9 (Falconry)			
	Masters:	6 @ 25.00	150.00	
	Apprentices:	12 @ 25.00	300.00	
	General:	10 @ 25.00	250.00	
	Class 10 (Falconry)			
	Raptor Breeding:	4 @ 10.00	40.00	
	Class 11 (Falconry)			
	Raptor Salvage:	24 @ 1.00	24.00	9,499.00
3304-61-05-40	Take Shiners	89 @ 10.00		890.00
3304-61-06-40	Field Trial Licenses	8 @ 15.00		120.00
3304-61-07-40	Taking of Eels	2 @ 25.00		50.00
3304-61-08-40	Quail for Training Dogs			
	Initials:	7 @ 7.50	52.50	
	Renewals:	25 @ 5.00	125.00	177.50
3304-61-10-40	Comm. Shooting Preserves	9 @ 50.00		450.25*
3304-61-12-40	Mounting Permits	2 @ 2.00		4.00
3304-61-13-40	Special Field Trial Permits	5 @ 15.00		75.00
3304-64-01-40	Tags and Posters			
	Game Tags:	4,688 @ .10	468.80	
	Fish Tags:	1,000 @ .05	50.00	
	Posters:	320 @ .10	32.00	550.80
				14,446.55

*25¢ deposited in incorrect receipt account number.

CHANGES IN
INLAND FISH AND GAME FUND BALANCE

Fiscal Year July 1, 1983 to June 30, 1984

Balance July 1, 1983 (Surplus)	$ 222,046.36
Total Revenue/Credits	5,933,831.44
Total Expenditures	-6,180,100.03
Decrease in Continuing Accounts Brought Forward*	305,862.08
Balance June 30, 1984 (Surplus)	$ 281,639.85

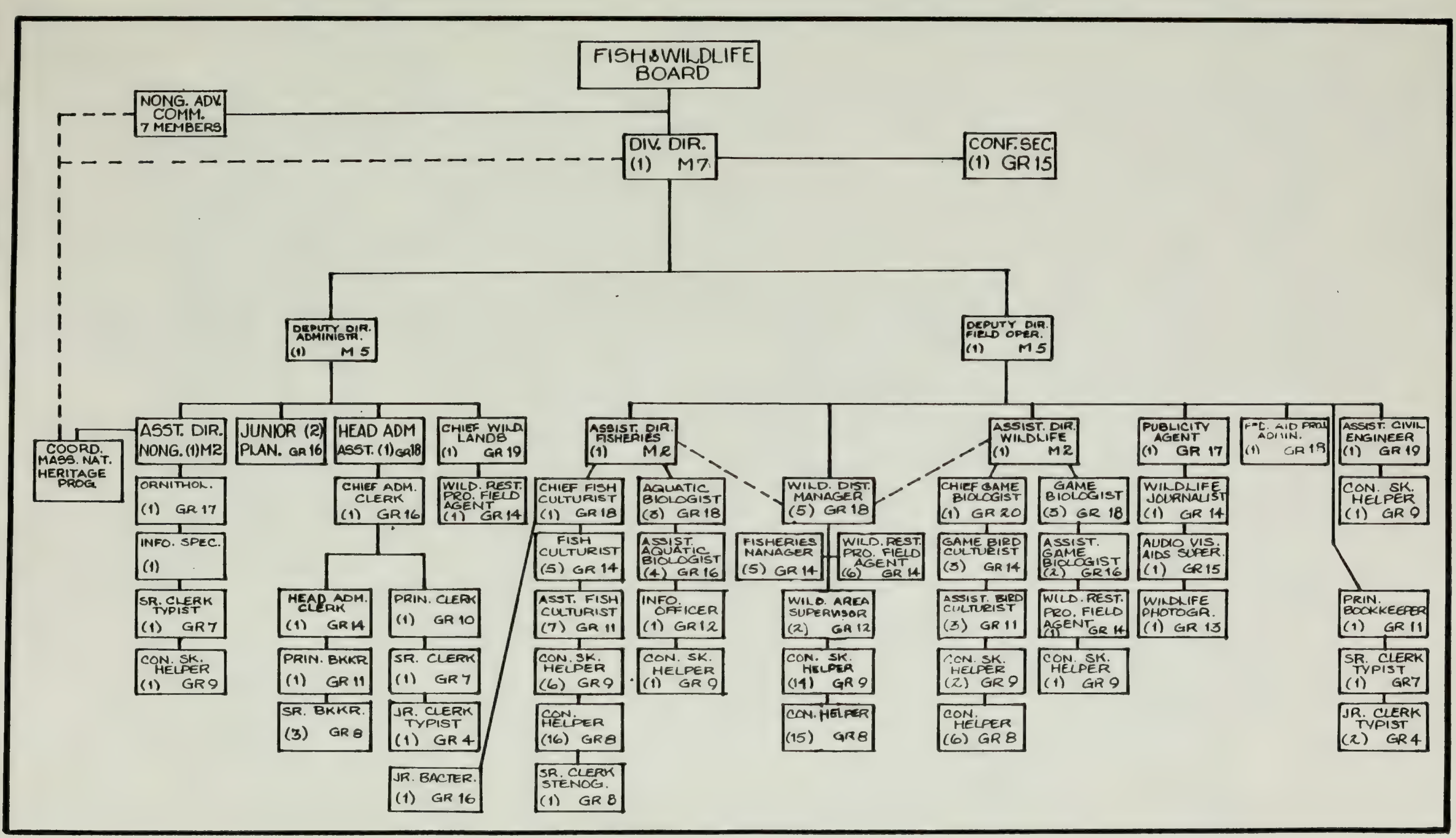
Continuing Accounts Brought Forward	1983	1984
Retirement Assessment (0612-1000)	$257,808.71	$24,028.29
Develop & Improve Facilities for Public Use (2310-0300)	24,965.02	57,236.07
Acquisition of Upland Areas and Inholding on Existing Areas (2310-0310)	568.75	1,665.27
Reserve for Encumbrances	105,449.98	.75
	$388,792.46	$82,930.38

1984	$ 82,930.38
1983	-388,792.46
	*$305,862.08

CHANGES IN
NONGAME WILDLIFE FUND BALANCE

Fiscal Year July 1, 1983 to June 30, 1984

Collected by State Treasurer	Receipt Account No.	Amount
Nongame Tax Checkoff	3015-59-01-40	$326,371.03
Collected by Division		
Sales, Other	3015-64-01-40	356.31
Miscellaneous, Other	3015-69-01-40	2,905.19
Federal Aid Reimbursement	3015-67-01-40	5,153.43
Indirect Cost Allowance	3015-62-01-40	3,284.50
Balance June 30, 1984 (Surplus)		$338,070.46


FISH & WILDLIFE BOARD
NONG. ADV. COMM. 7 MEMBERS
DIV. DIR. (1) M7
CONF. SEC. (1) GR 15
DEPUTY DIR. ADMINISTR. (1) M 5
DEPUTY DIR. FIELD OPER. (1) M 5
COORD. MASS. NAT. HERITAGE PROG.
ASST. DIR. NONG. (1) M2
ORNITHOL. (1) GR 17
INFO. SPEC. (1)
SR. CLERK TYPIST (1) GR 7
CON. SK. HELPER (1) GR 9
JUNIOR (2) PLAN. GR 16
HEAD ADM ASST. (1) GR 18
CHIEF ADM. CLERK (1) GR 16
HEAD ADM. CLERK (1) GR 14
PRIN. BKKR (1) GR 11
SR. BKKR. (3) GR 8
PRIN. CLERK (1) GR 10
SR. CLERK (1) GR 7
JR. CLERK TYPIST (1) GR 4
JR. BACTER. (1) GR 16
CHIEF WILD. LANDS (1) GR 19
WILD. REST. PRO. FIELD AGENT (1) GR 14
ASSIST. DIR. FISHERIES (1) M2
CHIEF FISH CULTURIST (1) GR 18
FISH CULTURIST (5) GR 14
ASST. FISH CULTURIST (7) GR 11
CON. SK. HELPER (6) GR 9
CON. HELPER (16) GR 8
SR. CLERK STENOG. (1) GR 8
AQUATIC BIOLOGIST (3) GR 18
ASSIST. AQUATIC BIOLOGIST (4) GR 16
INFO. OFFICER (1) GR 12
CON. SK. HELPER (1) GR 9
WILD. DIST. MANAGER (5) GR 18
FISHERIES MANAGER (5) GR 14
WILD. REST. PRO. FIELD AGENT (6) GR 14
WILD. AREA SUPERVISOR (2) GR 12
CON. SK. HELPER (14) GR 9
CON. HELPER (15) GR 8
ASSIST. DIR. WILDLIFE (1) M2
CHIEF GAME BIOLOGIST (1) GR 20
GAME BIRD CULTURIST (3) GR 14
ASSIST. BIRD CULTURIST (3) GR 11
CON. SK. HELPER (2) GR 9
CON. HELPER (6) GR 8
GAME BIOLOGIST (3) GR 18
ASSIST. GAME BIOLOGIST (2) GR 16
WILD. REST. PRO. FIELD AGENT (1) GR 14
CON. SK. HELPER (1) GR 9
PUBLICITY AGENT (1) GR 17
WILDLIFE JOURNALIST (1) GR 14
AUDIO VIS. AIDS SUPER. (1) GR 15
WILDLIFE PHOTOGR. (1) GR 13
FED. AID PROJ. ADMIN. (1) GR 18
ASSIST. CIVIL ENGINEER (1) GR 19
CON. SK. HELPER (1) GR 9
PRIN. BOOKKEEPER (1) GR 11
SR. CLERK TYPIST (1) GR 7
JR. CLERK TYPIST (2) GR 4

Massachusetts Division of Fisheries and Wildlife Annual Report 1985

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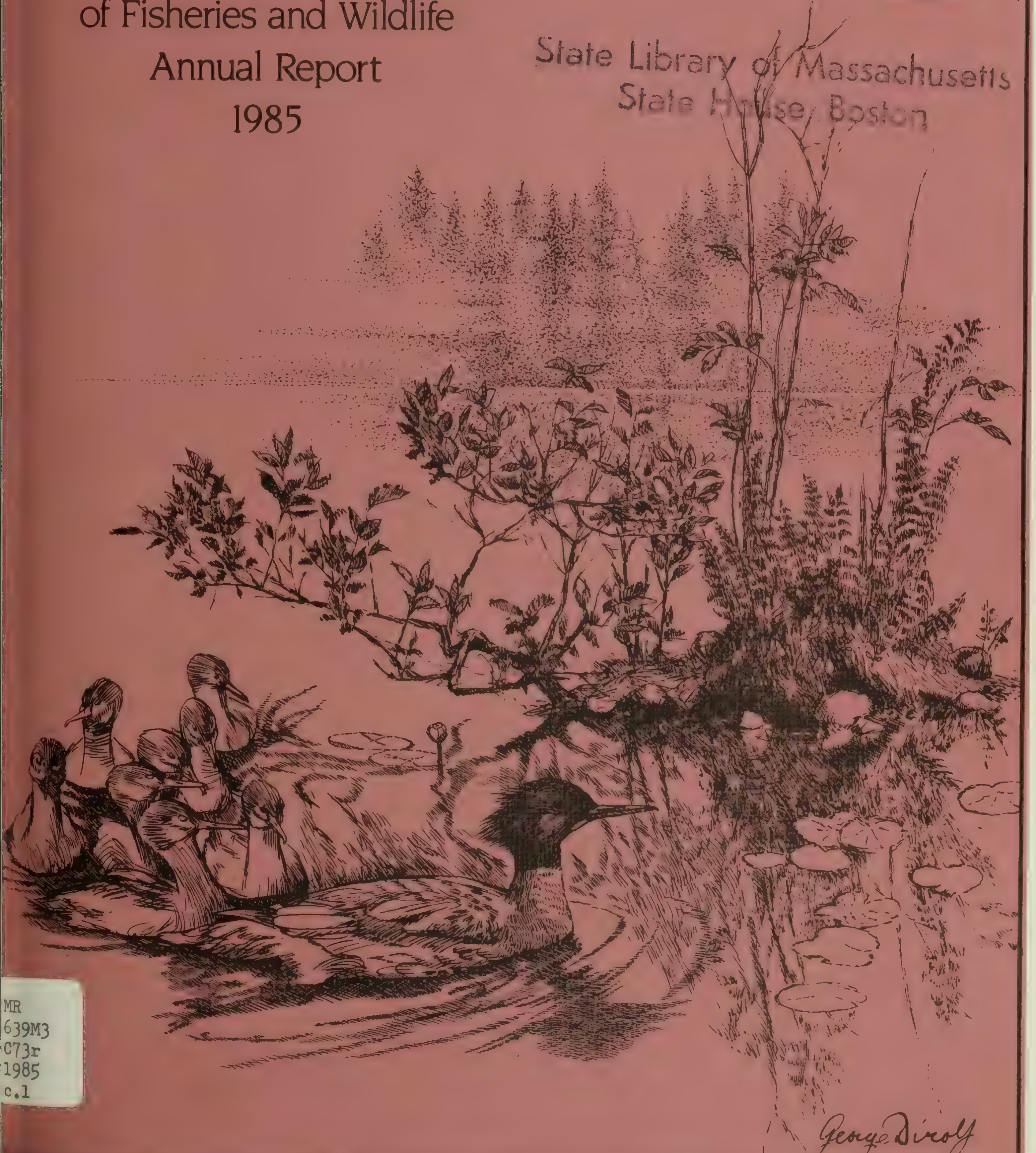

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The Commonwealth of Massachusetts
Division of Fisheries and Wildlife
Leverett Saltonstall Building, Government Center
100 Cambridge Street, Boston 02202

DIRECTOR

His Excellency, Michael S. Dukakis, Governor of the Commonwealth, the Executive Council, the General Court, and the Board of the Division of Fisheries and Wildlife.

Sirs:

I have the honor to submit herewith the One Hundred and Twentieth Annual Report of the Division of Fisheries and Wildlife, covering the fiscal year 1 July 1984 to 30 June 1985.

Respectfully submitted,

Richard Cronin
Richard Cronin
Director

PUBLICATION: #14,774-51-250-3-87-CR
Approved by the State Purchasing Agent

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Cover design by George DiRolf

The Board Reports

George Darey
Chairman

Throughout 1985, as in the past, the Fisheries and Wildlife Board melded public input with biological findings and recommendations to generate policies that benefit and perpetuate wildlife, streamline Division operations and, where possible, create programs to meet needs expressed by the public relating to wildlife. In this role, the Board held monthly meetings in locations around the state and held five (5) public hearings and informational meetings where and when needed.

These hearings dealt with such annually recurrent issues as the turkey season, establishment of waterfowl season dates, and a review of the antlerless deer hunting permit program. On these issues the Board voted to retain the turkey hunting season as it was during the previous year, continue the zoned waterfowl hunting season through a second year and add an additional 1,000 antlerless deer permits on the recommendation of staff biologists.

Early in the year, a press conference was held to announce that the Nongame Wildlife Fund had reached $368,000.00 in contributions (the final total for the year proved to be $380,000.00). The Board commended the Division for staff efforts on behalf of the fund as well as for their achievements in the many programs flourishing under the Nongame program. The Board's kudos to the Nongame program were echoed by the Governor who presented the program with one of the state's first "Pride in Performance" awards.

A wide variety of special issues occupied the Board's attention during the year, prime among them consideration of a proposal to reduce the number of game farms from three to two as an economy measure. Under a proposal formulated by the Division, it was demonstrated that the greatest savings would be realized by closing the Wilbraham Game Farm and increasing production at the remaining two farms to maintain production at the needed level. This proposal generated considerable public comment and a variety of alternatives were considered. After careful review, it was decided to close the farm as recommended and relocate staff to other Division installations.

Another issue requiring public hearings and generating public comment came in the form of a proposal to regulate taking of Atlantic salmon from the Merrimack River. Based on information presented by Division staff, the Board considered passage of a regulation, promulgated as an emergency regulation in 1985, prohibiting salmon fishing downstream of the Essex Dam in Lawrence and limiting to one salmon the fishery between the Essex Dam and the Route 104 bridge on the Pemigewasset River.

Other issues which occupied the Board did not require public hearings. Among these was the continuing consideration a concern expressed by officials of Beverly relating to waterfowl hunting on the Danvers River in the area of Kernwood Bridge. The Board reviewed all public safety aspects and ultimately voted to advise hunters against shooting within 500 feet of a particular channel marker on the south side of Kernwood Country Club Point and to ban such hunting if Beverly would ban feeding and attracting of birds to the area -- a provision submitted for consideration in a town-wide referendum.

The Board also addressed the issue of a state proposal to relocate Route 2 in the Erving area. With a number of alternatives proposed by the state, and a recommendation from the Division to support improvements on the existing Route 2, the Board members reviewed all options and conducted field trips to the area in question. The Board opted to support the recommendation endorsing improvements to the existing roadway with an alternate position noting that the southern route as proposed would be an acceptable second choice.

During the January meeting, visitors gathered to observe the Board as the Trustees of Reservations presented a proposal to address the overpopulation of deer on their Crane Reservation property in Ipswich. The Board heard findings based on research by Dr. Aaron Moen of Cornell University and the Trustees' action recommendations based on those findings. In addition, the Board heard testimony of Division biologists and a statement from the Massachusetts Society for the Prevention of Cruelty to Animals. Following review of all of the submissions the Board voted to permit The Trustees of Reservations to embark on its herd reduction program as outlined in a memorandum of understanding between The Trustees of Reservations and the Fisheries and Wildlife Board.

Other Board actions included consideration of a possible license fee increase. Although Director Cronin noted that the Division was operating "in the black" and that no increase was needed, the Board approved such an increase should it become necessary. The Board also voted to dedicate the Sunpoke Lake Project, built by Ducks Unlimited with donations from Massachusetts, to the late Warren Blandin.

Certain other issues occupied the Board's attention prompting the Board to request information for future review from the Massachusetts Division of Fisheries and Wildlife staff. Items in this category were a proposed extension of the primitive firearms season, a review of the status of the Housatonic River relative to the presence of PCBs, a status report on beaver in the Commonwealth, a review of Division publicity programs, and a review of the year-round open fishing season prompted by requests for restoration of the traditional opening day. Another issue which the Board chose to review was that of additional Catch and Release fishing areas. The Board also requested the wildlife section to investigate the possibility of a study of fawn mortality. While this could not be initiated immediately, the Board has been assured that such a study would begin during or about 1986. To bring Board members up to date on activities around the Commonwealth, District Managers presented an overview of activities and unique areas within their regions.

In examining members priorities for the upcoming year, the Board determined that one of their highest priorities was the establishment of Massachusetts Wildlife as a self-supporting publication. Legislative action will be required to implement this and to this end a proposal was included in the Division's budget request to establish a revolving fund for the magazine. Although that proposal was eliminated by the legislature, Director Richard Cronin has agreed to puruse the matter in hopes of having the fund reinstated.

Another high priority for the Board is improving forest management on lands held by the Division both for wildlife and for possible potential income. To this end, it was noted that it would be vital to obtain the services of a trained individual who would view forestry from a wildlife perspective. Within the year such a person was hired and forest wildlife specialist John Scanlon joined the staff and began surveying Wildlife Management Area boundaries in the Western District.

A source of satisfaction to both the Division and the Board was the completion, during this fiscal year, of the Division's policy document and of an initial five-year plan by the nongame section. This is the first Division policy since 1957 and the first nongame plan ever. Both documents were reviewed and approved by the Board and now serve as guidelines for Division program development.

Fisheries

Peter H. Oatis
Assistant Director of Fisheries

Survey and Inventory Investigations

Streams

A total of 162 sites on previously unsurveyed streams were sampled and assessed for fisheries use and potential. Data collected from this study are being used in conjunction with historic information to generate an automated stream classification system that will aid fisheries managers and biologists in determining stocking rates, issuing recommendations or orders of conditions in response to future watershed development projects. Considerable time was also spent in assessing the impact of acidification on stream fisheries primarily within the Millers River Watershed. A cooperative effort with the U. S. Fish and Wildlife Service to evaluate acidified stream mitigation techniques was initiated.

Lakes and Ponds

Fisheries biologists, fisheries managers and technicians completed field surveys at 18 lakes this year. Data have been analyzed and compiled in respective lake reports.

This information will be used in future planning and regulatory operations. Pond maps will be updated with access, depth and fisheries information for distribution to the public.

Quabbin Reservoir Investigations

The annual creel survey indicates that an estimated 44,648 anglers fished 262,394 hours to catch 32,397 fish, primiarly lake trout, smallmouth bass and landlocked salmon. Thirty-thousand, four hundred and eighty landlocked salmon yearlings were released into the reservoir. The landlocked salmon released in 1983 and 1984 provided the anglers with a harvest of over 1,500 legal salmon and approximately 14,000 sublegal salmon which were released. It is hoped that many of these fish will appear as legal fish in future years.

Recent sampling efforts throughout the watershed demonstrate that the effects of acidification are readily apparent. For example, mobilization of aluminum, mercury and vanadium since the early 1960's is apparent from sediment and tree core sample analysis. Caged rainbow trout failed to live more than a few days in known acid impacted tributaries and coves of the reservoir. Autoposies revealed that their deaths were due to low pH and high aluminum concentrations. Additional investigations ongoing at Quabbin include determining the effect of acidification on spawning success of smelt and lake trout.

The thirty-year water quality data-base for the Quabbin Reservoir and its main tributaries has been computerized and is presently undergoing analysis. Significant trends in alkalinity, pH,water level and fish produdction are being examined in an effort to better understand the existing impacts of acidification and to aid in the development of accurate models that will assist resource managers in developing strategies for countering the negative impacts of acid rain.

Angler Characteristic Mail Survey

Approximately 2,000 survey questionnaires were mailed to anglers selected at random from across the state in proportion to license sales in their town.

To date, 534 responses have been returned. Data from this and future surveys will be used in planning, evaluation, economic and regulatory deliberations. Returns are presently being computerized for analysis which should be completed in the near future.

Sea-Run Trout

This year biologists initiated a series of studies designed to evaluate spawning and survival of the wild sea run brook trout population in the Mashpee River. Broodstock collection of sea run brown trout (30 adults) was less than anticipated, however, the egg take (44,000) and survival were better than expected. Hopefully, this year class will provide approximately 20,000 yearlings when released in the spring of 1986. The fishery continues to provide excellent opportunities for those willing to spend the effort necessary to catch wild sea run browns.

Acid Rain Investigations

Working in conjunction with the Massachusetts Water Resources Center of the University of Massachusetts, the initial screening of all streams and lakes within the Commonwealth has recently been completed. This information, which could not have been generated without the assistance of numerous individual volunteers and volunteer laboratory services, provides a complete set of base line dataagainst which resource managers can assess changes in aquatic acidification or acid neutralizing capacity. Unfortunately, the data indicate that approximately 40% of our inland waters can be considered threatened by continuing acidification.

Other investigations conducted in cooperation with the Massachusetts Audubon Society and the Division of Water Pollution Control are being conducted at Great and Ryder Ponds in Truro in order to assess in greater detail the impacts associated with current liming practices designed to mitigate the effects of increased acidification. A great deal of staff time and effort are also directed at the preparation of a Generic Environmental Impact Assessment of the Division's Mitigative Pond Liming Program.

Technical Assistance

Increasingly staff time is being spent providing technical assistance to other federal, state and municipal agencies concerned with the conservation of aquatic resources and wetlands. Regular participation with such agencies as the State Pesticide Board, Energy Facility Siting Council, Interbasin Transfer Commission, Corps of Engineers and DEQE is necessary if Massachusetts' inland fisheries are to be protected and enhanced.

Extensive fish sampling efforts were conducted in conjunction with the Division of Water Pollution Control at the Charles River, Assabet River, Blackstone River, Lower Connecticut Basin, Millers River, Nashua River, Hocomoco Pond and Lake Winthrop. Samples were analyzed for PCB's and such heavy metals as mercury and lead.

Staff members are also participating on a monthly basis with the Division of Water Resources as a member of the inter-basin transfer committee.

Urban Angler

This unique program which is designed to introduce or re-introduce anybody to the enjoyment found in sport fishing through the training and instruction of dedicated volunteers is just beginning to bear fruit. This year we completed preparation of a training manual entitled Bluegill Basics that all instructors must study prior to conducting their series of angling clinics.

Program volunteers also assisted greatly in participating in a number of sportsmen's shows and special events that focussed public attention on the values of good sportsmanship and wise use of our aquatic resources.

Anadromous Fish

Connecticut River

The Holyoke fishway began operations on April 25, 1985 and shut down on July 15, 1985. Fishway activities were monitored by Massachusetts Cooperative Fisheries Research Unit personnel. Over 480,000 American shad, 630,000 blueback herring (a new season record), 285 Atlantic salmon (the second highest number trapped at Holyoke), 369 striped bass and 40,000 sea lamprey passed through the facility. A record number of salmon, 43, were observed in a single day. Approximately 6,400 shad were transported from the Holyoke facility to other New England restoration programs; New Hampshire, Rhode Island, Pennsylvania and other Massachusetts rivers. The fishway was operated in the fall in an attempt to capture additional salmon, but none was recovered. A total of 306 adult Atlantic salmon were recovered river wide this year. Most of these were held at Federal broodstock holding facilities.

The Turners Falls fishways were operated from mid-May to the end of June. This facility was also manned by the Massachusetts Cooperative Fisheries Research Unit personnel. The Gatehouse fishway passed 3,855 American shad, 301 blueback herring, three Atlantic salmon and 1,809 lampreys into the Turners Falls pool. The shad figure represents only approximately 10% of the total number of shad passed through the Cabot Station fishway (31,000) indicating a serious problem with fish passage in the canal system. Northeast Utilities has begun looking into this problem by conducting shad radio-telemetry studies in the canal. Northeast Utilities has also prepared a preliminary permit (to FERC) to construct an additional hydro wheel, Unit 7, at Cabot Station. The Massachusetts Division of Fisheries and Wildlife has been actively participating in the review of this project.

The Connecticut River Atlantic Salmon Commission prepared and adopted salmon fishing regulations for the mainstem of the river. These regulations are to be incorporated into the existing fishing regulations in each of the four basin states.

Division personnel also participated in bi-monthly Technical and Policy Committee meetings. We also were involved in several sub-committees directed at resolving specific questions related to the salmon and shad programs.

Over 320,000 Atlantic salmon smolts were released this past spring at five stocking locations located throughout the basin. This represents the second largest release in the history of the program. Over 40% of these were released in Massachusetts; 107,000 at Turners Falls, 17,300 in the Deerfield River and 17,300 in the Millers River. An additional 64,000 salmon fry were also released in the Bear and South Rivers of the Deerfield Basin. The Massachusetts Cooperative Fisheries Research Unit personnel assessed some of these rivers and found good survival and growth of salmon fry stocked in 1984 and 1985.

The U. S. Fish and Wildlife Service has begun negotiating with Northeast Utilities for land to construct a research laboratory in the vicinity of Cabot

Woods, Turners Falls. This facility will allow students and research biologists to conduct studies relating to fish passage, anadromous fish and riverine ecology.

Merrimack River

The Lawrence fishway began operations on May 1, 1985 and closed down on July 22, 1985. This facility was operated by the Massachusetts Division of Fisheries and Wildlife and the Massachusetts Marine Fisheries. During this time, we observed over 13,000 American shad,202 Atlantic salmon, 23,000 herring, 18,000 sea lamprey and 110 striped bass.

New Hampshire Fish and Game transported 980 adult shad from the Holyoke trapping facility to the Merrimack River. They were released in the Concord, New Hampshire area. The New Hampshire Fish and Game also transported 110 adult shad from the Lawrence trapping facility to the Nashua River. There should be fish passage at the two lower most barriers on the Nashua in the very near future so it is important to begin restoring American shad to this river. The State of Maine also transported shad from the Lawrence fishway. They released approximately 150-200 fish to their Androscoggin River.

Most of the 212 returning adult salmon were transported to the Nashua National Fish Hatchery in New Hampshire. Thirty-six of these were released into the Pemigewasset River, (New Hampshire) because of potential disease problems. Some of these were fitted with radio tags to allow U. S. Fish and Wildlife Service biologists to monitor their movements.

Scale analysis of the 212 salmon indicated that 43% were a result of the fry stocking program and the remaining 57% resulted from smolt stockings. The sex ratio was 63% females and 37% males, 92% of the fish were 2-sea-winter fish 2% were 3-sea-winter fish and 6% were grilse.

Eggs taken from the recovered broodstock brought in 458,000 for next year's programs.

Over 158,000 smolts, 16,000 parr and 148,000 fry were released throughout the basin.

A creel census was conducted below the Essex Dam to monitor the shad sport fishery. While the data have yet to be analyzed, it appears that the sport fishery was almost equal to that noted in previous years (4,000 anglers, 9,900 hours of recreation catching 6,000 fish). Incidental catch is estimated at 12-15 Atlantic salmon.

The project leader attended several North Atlantic Salmon Conservation Organization Research Committee meetings. The Division was charged with preparing a salmon tagging program to evaluate high-seas interception of U. S. salmon. This proposal was given to the North Atlantic Salmon Conservation Organization Commissioners and was reviewed by the various working groups.

Proposed Sewalls Falls hydro project: The Division became an intervener of this project because of its potentially detrimental effects on the salmon and shad restoration program.

Fish passage at Lowell is near completion. It should be ready for field testing and operations in 1986. The power plant at this facility has been in operation for most of 1985. It will probably take a few years to obtain optimum performance from this complex fish passage facility.

The Policy and Technical Committees have begun negotiations with Public Service of New Hampshire with regard to upstream and downstream fish passage, and minimum flows at Amoskeag, Hookset, Garvins Falls, Eastman Falls and Ayers Island, the next five barriers to fish passage on the Merrimack.

Both the Connecticut and Merrimack Rivers were closed to Atlantic salmon fishing in 1985.

Fisheries Development

Large Esocids

Significant improvements in the culture of large esocids, tiger muskie and northern pike were made at the Roger Reed Hatchery. New fiberglass rearing tanks were installed and removed from the fence area in an attempt to keep the program safe from the vandalism that we have experienced in recent years. Approximately 10,000 yearling tiger muskie are scheduled to be released this spring. The Division also received about 10,000 northern pike fry from the state of Rhode Island. These fish will be reared through the yearling stage at Reed Hatchery. Pike produced from this system will be used to stabilize those fisheries initiated with pike purchased through a private dealer from Minnesota. This latter source of pike while producing excellent fish is unreliable because of the dependence upon natural production. This year, we were able to purchase 12,000 yearlings from Minnesota. These fish were released only into waters which had received shipments of pike from this source in the past.

Walleye

Attempts to establish a spawning population of walleye in Assawompsett Pond via the release of fry reared at the Attleboro National Fish Hatchery appear to be at least partially successful. During this spring, two pound nets were fished from February 28, to April 2. 1985. A total of 124 walleye were caught and tagged. Seventeen of these fish were females. A few walleyes were reported, by reliable anglers, as caught from the Nemasket and Taunton river systems. If the population of mature walleye continues to show evidence of growth in subsequent years, a portion of their eggs will be used as stock for release into other waters deemed capable of supporting a walleye fisheries.

Fish Hatcheries

David Fredenburgh
Chief Fish Culturist

During the 1985 fiscal year, the hatcheries produced 1,087,600 fish weighing 455,893 pounds. Of that number, 448,000 were classified as 9"+ and over 150,000 were in the 12+ category.

Normal maintenance was carried out at all the hatcheries.

The pollution control project was completed at the McLaughlin Hatchery. The project was bid at $545,000. Because the project was not completed on time, the contractor was charged for completion damages of $18,000.00.

Plans were finally formulated to re-build the Sunderland Hatchery. The other four facilities have had some degree of upgrading in the past years and are in relatively good condition. Sunderland is the last hactchery to receive an upgrading. The plans are to consolidate the rearing facility beside the entrance to the driveway. The present area will be filled in with gravel and above ground fiberglass tank will be utilized. A new gravel-pack well and water system well will be constructed. This project will be completed in segments as the money is appropriated. Anticipated completion date is 1989.

At Sandwich a new well was completed that will help augment the existing ground water supply.

Wildlife

Wayne F. MacCallum
Assistant Director of Wildlife

The Wildlife Research Section is responsible for the management of the approximately 75 species of birds, mammals, reptiles and amphibians which are traditionally hunted or trapped. Principal activities of the section include monitoring of population levels and annual harvest, development of recommendations concerning regulations and policy relative to the Commonwealth's wildlife resources, planning and implementation of habitat management programs, development of Division funded University of Massachusetts Cooperative Wildlife Research Unit studies, technical assistance to other agencies and private citizens experiencing problems caused by wildlife, development and implemenetation of wildlife research programs qualifying for federal grants. Summaries of current programs follow.

WATERFOWL

Preseason Banding

A total of 1,049 ducks were banded during the 1984 preseason period; 567 wood ducks, 249 mallards, 69 black ducks, 9 mallard X black hybrids, 43 bluewinged teal and 119 greenwinged teal. A new airboat came into use in late August, the old boat having been given to the U. S. Fish and Wildlife Service. The new boat has a 260hp Lycoming engine, providing considerably more power than the old boat. The additional power and flat bottomed hull construction allow operation in shallower water than the old boat and a special polymer shield on the bottom is puncture resistant reducing "down time" for hull repair.

Mid-Winter Waterfowl Survey

A total of 246,511 waterfowl were counted during the January 1985 winter inventory, the second highest count in more than 20 years due to a seaduck count of 166,658, of which 132,073 were eiders. Black ducks (23,091) were up 13% over both last year's count and the previous 10 year average. Mergansers were also at a record high with a count of 20,630, 180% above the 10 year average. Scaup were up over last year but below the 10 year average and most other ducks were down from last year. Canada geese were up 10% over last year, but 5% below the 10 year average.

Winter Banding

Division personnel and cooperators banded 806 black ducks, 147 mallards X black hybrids, 21 mallards, and 16 pintail. These along with 570 black ducks banded by Parker River National Wildlife Refuge allowed the state to meet its quota of 600 female and 400 male black ducks.

Wood Duck Nest Structure Study

Four wood duck and one hooded merganser used plastic buckets on 13 study areas while six wood ducks and two mergansers nested in wooden boxes in 1984. This was the first use of plastic buckets on these areas. Usage on 15 established areas ran 43% for 46 buckets and 57% for 170 boxes. Success rate was 50% in buckets and 78% in boxes. In 1985, five wood ducks used buckets on the new areas while six wood ducks and two mergansers nested in wood boxes. Usage on the 15 established areas ran 41% for 46 buckets and 59% for 169 boxes. Success rates were 63% in buckets and 91% in boxes.

Biological Tagging of Wood Ducks

The project leader volunteered to assist Jim Thul of the Florida Game and Freshwater Fish Commission in examining blood smears for parasites. Thul sent up 150 smears collected in Virginia in October. The project leader accomplished the task and reported the findings to Thul for inclusion in analysis of southeastern states data.

Wood Duck Production Study

During the 1984 nesting season, 195 nest starts were recorded in 522 available structures on 50 areas across the state. There were 130 successful wood duck hatches and six hooded merganser hatches. A week of rain in late May 1984 led to extensive flooding and a loss of a number of clutches during the peak week of hatching. In 1985, 195 nest starts were recorded in 532 available structures. There were 130 successful wood duck hatches and six merganser hatches. This was the most successful season in seven years.

Park Waterfowl Project

A paper "The Role of Parks in the Range Expansion of the Mallard in the Northeast" was presented at:Waterfowl in Winter, a symposium and workshop held in Galveston, Texas 7-10 January 1985 and at the winter technical section meeting of the Atlantic Waterfowl Council in Savannah, Georgia 19-22 February 1985.

Canada Goose Parts Collection Survey

Measurements were taken from 113 geese killed by hunters from various parts of the state and from 24 geese found dead of lead poisoning on the Parker River National Wildlife Refuge during the 1984-85 hunting season. These data were added to the 247 measurements made in 1983 and are currently on file with the Massachusetts Division of Fisheries and Wildlife.

Measurements were also taken from 45 adult geese drive-trapped by Parker River National Wildlife Refuge personnel in Newbury during July 1984 to get some baseline data on breeding resident geese in northeastern Massachusetts. In addition, 15 adult geese were measured during a trap and transplant program conducted at the Worcester Science Center.

Experimental Waterfowl Season Appraisal

The 1983-84 season was the first year Massachusetts was divided into three zones. Waterfowl harvest was down 5% from the 1981-83 seasons when the state was divided into two zones and down 30% from the prezoning years of 1978-1980. Major decreases in harvest were recorded for wood ducks and black ducks. Special black duck harvest restrictions were imposed along with zoning in 1983-84 and resulted in a 27% decline in the black duck harvest.

MOURNING DOVE

The total number of calling doves on three long-term standardized routes increased 25% during 1984-85. The total of counts on all 18 routes decreased 6% (200 to 187) from 1984-85.

TURKEY

The sixth Massachusetts spring gobbler hunt was held in May 1985 in all counties and portions of counties west of the Connecticut River. The season was extended to three weeks, consisting of a one-week first period and a two-week second period. Sportsmen were allowed to apply for and hunt during only one of the two periods. A total of 3,800 permits were allotted for each hunt period, of which 3,468 were issued for the first period and 2,250 for the second period. A record kill of 309 turkeys (226 first period, 83 second period) was attained with an overall participation rate of 88.4% (5,072) and a hunter success rate of 6.1%. The Berkshire County kill was 213 (69%); Franklin County, 39 (13%); Hampden County, 34 (11%); and Hampshire County, 23 (7%). Adult males (200) comprised 65% of the kill.

Winter weather conditions again hampered trap-and-transplant. Only 7 turkeys (1 IF, 4 IM, 2 AM) were captured for a mean capture rate of 0.13 birds per trap hour and a mean capture success of 44%. This is the poorest capture rate and success rate since 1980, when no birds were captured. The six males were transferred to Middleboro, Plymouth County. The single hen was released at the capture site.

WOODCOCK

The Fisheries and Wildlife Board continued the two bird daily limit on woodcock which had been in force since 1982. Although woodcock have made a good recovery, the census indicated that levels were still below the long-term average.

Daily hunting success improved slightly during the 1984 season but fewer hunting trips per hunter slightly decreased the total bag of birds.

The 1985 spring census of woodcock showed that populations have improved for the second year in a row. The spring was warm and dry through the peak of hatching and production was anticipated to be excellent. The Division recommended to the Board that the daily limit of woodcock be liberalized to three birds.

BEAVER

The 1984-85 beaver season was changed to run from 15 November to 28 February statewide, with no Conibear-type traps larger than size #110 or equivalent allowed after 15 January. During this season, a total of 1,052 beaver were taken by 95 trappers in 101 towns, for a mean take of 11.1 beaver per successful trapper. This take represents an increase of 521 beaver (98.1%) over 1983-84. Increases occurred in all counties and regions, but were most pronounced in Essex (+ 766.7%), Hampden (+ 170.6%), and Worcester (+ 166.9%) counties and the Eastern region (+ 153.7%). The harvest in the Eastern region (713 beaver, 67.8%) is the greatest on record. Pelt prices increased to an average of $18.26, but continue to be below the ten-year average.

OTTER AND FISHER

During the 1984-85 otter season, 68 successful trappers took 142 otter in 70 towns in ten counties for an average of 2.1 otter per successful trapper. This compares with a harvest of 119 and an average of 2.0 in 1982-84.

The fisher take increased from 124 in 1983 to 140 in 1984, with 58 successful trappers taking an average of 2.4 fisher each among 54 towns in seven counties (57 trappers averaging 2.2 in 1983).

Worcester (80), Franklin (16), and Essex (15) counties and deer management zones 03 (39), 04 (35), and 02 (27) yielded the most otter, while Worcester (75), Essex (25), and Franklin (21) produced the most fisher.

A total of 130 otter and 138 fisher carcasses were collected. The mean age of otter in 1984-85 was 2.17 and of fisher 1.55. This compares with 1.97 for otter and 1.62 for fisher in 1983-84. Ten of 12 otter aged 2.5 and older and 14 of 15 fisher aged 1.5 and older showed evidence of reproductive activity. Average corpora lutea counts were 2.5 for otter and 3.0 for fisher in 1984-85, as compared to 2.5 and 3.1 respectively in 1983-84.

BOBCAT

A total of 36 bobcat were taken in 1984-85, including 13 by hunting, 21 by trapping, and two road kills. The mean take per successful hunter (N=11) and successful trapper (N=17) was 1.2 each. Bobcats were trapped most frequently in November (18, 85.7%) and shot in January (5, 41.7%). In 1984-85, bobcats were taken in 26 towns in five counties. Juveniles (0.5 age class) comprised 16.7% of the take, with an average placental scar count of 2.4 scars/animal with countable tract. The average pelt price was $56.22.

COYOTE

A total of 42 coyotes were taken by 29 sportsmen in 29 towns and six counties during the 1984-85 hunting season. Over one-half (52.4%) of the kill was in November, with the same number and percentage hunting specifically for coyote. Immature coyotes comprised about two-thirds (65.7%) of the kill. Fifteen additional mortalities, principally road kills, were tallied during 1984-85.

FUR HARVEST

The value of the Massachusetts fur harvest increased 34% from the previous year.

BLACK BEAR

A total of 878 bear hunting permits were issued for the 1984 bear hunting season. A record number of 17 bear were taken, including 16 in the first period and one in the second period. Eight males and nine females were taken in Berkshire (6), Franklin (6), Hampshire (4), and Hampden (1) counties. Six non-hunting mortalities were recorded including two illegal kills, one nuisance kill, one road kill, one found dead, and one euthanized. Three nuisance complaints (2 involving bees) were received.

COOPERATIVE WILDLIFE RESEARCH UNIT STUDIES

Wild Turkey Population Dynamics

Major flock dispersals occurred during the first three weeks of April. Hens moved an average of 5.42 km from center of their winter range to their nesting area.

Seventeen of 20 monitored hens (85%) are known to have attempted nesting. Ten of 17 (59%) initiated incubation during last week of April and first two weeks of May. Six of 17 first nesting attempts (36%) were successful. Average clutch size was 12.6 (N=5). Average brood size was 11.2 (N=5). As of 20 June, one of six unsuccessful hens (17%) had attempted re-nesting.

Ten birds died during the report period. Five hens (4 immature, 1 mature) were lost through predation. One hen (immature) succumbed to a fungus infection of the crop. Two hens (immature) are believed to have died as a result of handling, and 2 hens (1 immature, 1 mature) died of unknown causes.

Black Bear Sow Cub Interactions and Reproductive Success

Seven adult females that were potential cub producers in 1985 were followed intensively on foot from early September through denning to construct a profile of each female's major fall food sources. Evidence of feeding activity was collected about every three days on each female, and samples of food items were analyzed for protein, fat and fiber. One female died in mid-September and another disappeared in late October 1984. The remainig five were followed through denning.

Between 5 February and 13 February, dens of the five remaining single, adult females were visited. Females were weighed, measured and milk and blood samples were drawn. New cubs were counted, sexed, weighed, and marked with small temporary ear tags. Four of five sows produced 12 cubs (4:3:3:2). Dens were visited again in the last week of March. Females and cubs were weighed again and milk and blood samples were drawn from the sow. Cubs were fitted with small, expandable radio collars that were designed to break off in about 2-3 months. This will help to determine causes of mortality to young cubs.

Families have been followed intensively since emergence to compile a spring food profile and to determine how the sow's spring nutritional state may affect cub survival until weaning.

Milk and blood samples are being analyzed to try and correlate chemistry parameters with nutritional condition of the sow.

Ecology and Status of the Bobcat in Western Massachusetts

A radiotelemetry study of bobcat (*Felis rufus*) ecology was initiated to determine the status of this important furbearer in western Massachusetts. This study has now been completed. Home range, movement, activity, habitat use and social structure data were collected on 16 radio-tagged bobcats during 1982-85. Male home ranges averaged 116.8 Km^2 (SD-41.2, N=8) while female home ranges averaged 77.5 Km^2 (SD=68.9, N=6). These were similar to home ranges reported for bobcats in other northeastern states. Bobcat movement was variable between seasons and sexes. Mean daily movement was 2.34 ± 2.22 Km for males and 1.88 ± 1.50 Km for females. Greatest daily movement was during summer and fall. Mean hourly travel distances was 404 ± 440 m. Activity data varied seasonally with bobcats most active during all hours of the day in summer and fall and primarily nocturnal in winter. Preferred habitat types were regenerating forest, small hardwoods and other early successional stages. Cottontail rabbits (*Sylvilagus* sp.) were most frequently hunted by bobcats and were the predominant prey species observed in food habits analysis of digestive tracts and scats. The sex ratio of harvested bobcats was 1.04 males per female. Ages of harvested bobcats were typical of a healthy population with 23% juveniles and 19% yearlings. Reproductive tracts of female bobcats indicate low reproductive rates by first year of implantation and percent of females with placental scars. Of six radio-collared females monitored through the reproductive season, only one had kittens. Six radio-collared bobcats died from natural causes; two bobcats were killed by predators and pneumonia, gastric enteritis, a motor vehicle, and old age/starvation killed one each. Social structure as exhibited by home range distribution appeared variable. Extensive excursions by adult bobcats were observed during breeding and fall seasons. Indirect evidence suggests a lack of territoriality among bobcats in western Massachusetts. Large home ranges with extensive overlap, disjunct home ranges, seasonal excursions, and seasonal shifts in home ranges indicate a certain degree of nomadic behavior. The low incidence of scent-marking behavior observed from snow-tracking data also suggests a lack of territorial behavior in this population of bobcats.

DEER

The 1984 statewide deer harvest for all seasons combined was 4,477 deer. This total closely followed the increasing harvest trend started in 1967 when the antlerless permit system was established. The four western counties of Berkshire, Franklin, Hampshire and Hampden accounted for 72% (3,216 deer) of the reported harvest. Worcester County recorded 499 deer killed (11% of the total harvest). Essex, Middlesex, Norfolk, Bristol, Plymouth, and Barnstable Counties reported 403 deer killed (9%). The islands of Dukes and Nantucket Counites contributed 200 (4%) and 159 (3%) deer to the total harvest respectively.

Shotgun season hunters harvested 3,650 deer (82% of total harvest), including 2,203 antlered and 1,447 antlerless deer (defined as deer having no antlers or having antlers less than 3" in length). Archers harvested 470 deer (251 antlered, 219 antlerless) and primitive firearm hunters killed 346 deer (78 antlered, 268 antlerless). Paraplegic hunters took two antlered and nine antlerless deer during their special season.

Approximately 38,400 valid antlerless deer permit applications were received prior to the public drawing in October. Permits were allocated to 8,150 sportsmen and 424 farmer/landowners. The odds of a permit holder harvesting an antlerless deer during the shotgun season were about 1 out of 6.

Natural Resource Officers reported 408 non-hunting deer mortalities during the 1984 calendar year. Deer killed by motor vehicles accounted for 80% of the reports, dog kills (10%), and other causes (10%).

FALCONRY

During 1984 there were 32 active falconers. Five of the falconers had breeding permits and 29 Raptor Salvage permits were issued. The salvage permittees treated a total of 229 raptors; of these 97 (42%) were released back to the wild.

MAST PROJECT

The mast project was designed to provide a record of mast production from year to year on both a statewide and regional basis and to compare records of mast production with game harvest data. This project was discontinued after a five year trial because the data gathered provided inconclusive measurements concerning regional mast production.

FOREST MANAGEMENT PROGRAM

The Division's forestry inventory was initiated in May, 1985. In cooperation with the University of Massachusetts Department of Forestry and

Wildlife, and the Massachusetts Cooperative Wildlife Research Unit, the Division hired two undergraduate students (one forestry major and one wildlife major) to conduct field surveys from 1 June through 31 August 1985. Field work began on the Savoy Wildlife Management Area in the Western District, and involved the establishment of inventory sample plots on a grid system throughout the management area. Data from 71 sample plots yielded information on: (1) the volume and variety of existing forest products (timber and firewood), (2) the abundance of woody and herbaceous vegetation on the forest floor (which relates directly to wildlife habitat quality), and (3) the specific location of various forest stands. Arrangements were made for the inventory data to be analyzed through an existing computer program under the direction of UMass Forestry Professor Joe Mawson. In addition to these data, boundary lines for the management area were determined and marked in the field.

The forestry management program will concentrate on management areas in the Western District first, then into the Connecticut Valley and Central Districts where each wildlife management area will be evaluated.

STATEWIDE DEVELOPMENT

The Statewide Development Project is charged with the operation of Wildlife Management Areas and the construction and maintenance of nesting structures.

Wildlife management area operations include habitat management, as well as public access work and area administration, such as planning and management of controlled hunts.

Nesting structure work includes the statewide erection and maintenance of wood duck nesting boxes, osprey nesting platforms, and bluebird nest boxes. Loon nesting rafts are also constructed and maintained on Quabbin Reservoir. Below is a summary of activities during Fiscal Year 1985:

1. Buildings: Maintained 15 buildings on 11 areas.
2. Dams: Maintained 7 dams on 4 areas.
3. Bridges: Constructed 3 foot bridges on 3 areas and maintained 8 bridges on 5 areas.
4. Roads and Trails: Constructed 3.8 miles of trails on 2 areas and maintained 119.3 miles of roads and trails on 15 areas.
5. Parking Lots: One lot was constructed and 95 lots were maintained on 21 areas.
6. Waterfowl Blinds: Waterfowl blinds (15) were maintained on 2 areas.
7. Signs and Boundary Markers: Erected 991 signs on 7 areas and marked 1.0 miles of boundary. Maintained 1,559 signs on 38 areas and checked 107 miles of boundaries on 30 areas.
8. Tree and Shrub Planting: Planted 1,160 shrubs and 415 trees on 5 areas.
9. Herbaceous Seedings: Planted and top-dressed 147 acres on 8 areas and oversaw cooperating farming of 803 acres on 9 areas.
10. Clearing: Four acres were cleared on 2 areas.
11. Vegetation Control: Unwanted brush was controlled with a tractor drawn brush cutter, by handcutting, and with herbicides. A total of 315 acres on 13 areas were cut and 88 acres on 2 areas were treated with herbicide.
12. Timber Management: Selective cuts were made on 13 acres in 3 areas.

13. Nesting Structures: Erected 177 wood duck boxes, 220 bluebird nest boxes, 7 osprey nesting platforms, and 5 loon nesting rafts. Maintained and checked 941 wood duck nest boxes.
14. Water Level Management: Manipulated water levels to encourage emergent vegetation over 163 acres on 2 areas.
15. Managed Public Hunts: Managed hunts were held on 4 areas.
16. Prune and Release Trees: Pruned and eliminated vegetative competition from around 368 fruit-bearing trees and shrubs.
17. Gates: Constructed 2 gates on 2 areas and maintained 23 gates on 6 areas.

Additional time was spent in administering the project, inspecting areas, and maintaining equipment used on the project.

Game Farms

E. Michael Pollack
Chief Game Biologist

On December 14, 1984, the Fish and Wildlife Board, upon recommendations of the Director, voted to close the Wilbraham Game Farm in order to reduce the cost of the game farm program. Consolidation into a two game farm system has resulted in substantial labor savings.

The Ayer and Sandwich Game Farms are now geared to produce the annual scheduled production of 44,000 pheasants and approximately 3,500 bobwhite quail. Upon closure of the Wilbraham Game Farm, all propagation supplies, materials, and equipment were transferred to the remaining two farms.

Continuous efforts are being made to reduce both feed and labor costs. Four new bulk feeders were purchased. The purchase of pheasant feed in bulk reduces feed costs considerably.

New pheasant pens were constructed at the Ayer Game Farm allowing the rearing of 5,000 or more pheasants. Other pens will be constructed in the coming year. Upon completion of these projects, the Ayer farm may be capable of distribution to all districts except the Southeast.

During this reporting period, the Sandwich Game Farm experienced an outbreak of Fowl Cholera. The end result required the Division to acquire (at no cost) pheasant eggs from New York, Pennsylvania and New Jersey state game farms.

Pheasant Production

1984

Farm	A	SR	B	C	PG	Total
Sandwich		120	1,164	2,140	6,236	9,660
Ayer	48	1,735	1,528	4,328	12,336	19,975
Wilbraham	—	2,420	2,912	9,528	5,948	20,808
Totals	48	4,275	5,600	15,996	23,520	50,443

Quail Production: 3,600

White Hare Purchased: 800

Nongame and Endangered Species

Bradford G. Blodget
State Ornithologist

This was a milestone year for the Nongame and Endangered Species Program. Fiscal 1985 was the first year that funds were made available from the Nongame Wildlife Fund Checkoff on the State Income Tax Form. The approved budget of $297,436.00 was a significant increase over the $45,481.00 of 1984. Approximately one-third of this budget was set aside for land acquisition. Due to unwilling sellers only one small land purchase was made and the unused monies reverted back to the Nongame Wildlife Fund for future use.

The first new program to be established with checkoff funds was a Peregrine Falcon Release Project in downtown Boston. This project is the Division's first major wildlife restoration effort placed in an urban setting and quickly became the center of frequent media attention. If successful, this restoration project effort will lead to the first breeding pair of peregrine falcons in Massachusetts since 1951.

Peregrine Falcon Restoration

A release site was constructed on the roof of the federal John McCormack Post Office and Court House Building. On July 17, 1984, six young falcons were placed in their hack box. These birds were released on July 26th. By early September, three of the six had learned to hunt on their own and had left Boston to migrate south for the winter. Of the three that did not disperse, one broke a wing and was returned to the Peregrine Fund in Ithaca, New York as a future breeder, one was killed by an airplace at Hanscom Air Field, and one was killed by flying into a window.

Six young were received on June 7, 1985 for the upcoming Fiscal Year 1986 release.

Bald Eagle Restoration

Six young birds from Cape Breton, Nova Scotia were placed on the hack tower at Quabbin Reservoir on June 14, 1984. One died unexpectedly of an intestinal infection on July 15th, but the remaining five were released in good health on July 26th.

Eight young birds were received from Nova Scotia on June 21, 1985 for the upcoming Fiscal Year 1986 release.

Bald Eagle Winter Survey

The survey for the winter of 1984/1985 was conducted on January 11, 1985. A total of 28 bald eagles (15 adults and 13 immatures) was observed statewide. Twenty-one of these (11 adults and 10 immatures) were found at Quabbin Reservoir. During the same survey, three golden eagles were recorded, all at Quabbin.

Plymouth Red-bellied Turtle

A contract with Dr. Terry Graham of Worcester State College to conduct research on the natural history and management of the Plymouth Red-bellied Turtle was continued.

A "headstart" program was begun by placing 10 hatchlings in the New England Aquarium in November, 1984 and releasing these turtles at a much larger size on June 26, 1985. By keeping these young turtles in a warm climate and feeding them all winter, they grew to a much larger size and were released with a significantly better chance of survival.

Piping Plover

Over 30 observers reported seeing a total of 131 breeding pairs of Piping Plover at 38 sites. Massachusetts continues to have more breeding pairs of these plovers than any other East Coast state or province. A cooperative study entitled "Management, Habitat Selection and Population Dynamics of Piping Plovers on Outer Cape Cod, Massachusetts" was begun by Ms. Laurie McIvor at the University of Massachusetts, Amherst.

Tern Inventory and Management

Results of the annual tern census, coordinated by the State Ornithologist, Bradford Blodget, yielded 11,518 breeding pairs in the state. This included 7,548 pairs of Common Tern at 24 sites (up 9% from 1984), 2,338 pairs of Least Tern at 43 sites (slightly less than 1984), 1,618 pairs of Roseate Tern at eight sites (down 11% from 1984), and 14 pairs of Arctic Terns at four sites (the same as 1984). The most noteable change was the nearly complete collapse of the Monomoy-North Common Tern colony. In 1985 only 290 pairs remained; down from 3,400 pairs in 1980, and 1,200 pairs in 1984.

Osprey

This was a record year for nesting osprey. A total of 103 nests were occupied; 88 of them were successful (75%), producing 145 fledged young. Each successful nest produced an average of 2.2 young.

Nest poles were erected for osprey prospecting outside of their current nesting range at Quabbin Reservoir and on Plum Island. The present breeding range includes localities in Barnstable, Bristol, Dukes, Nantucket and Plymouth Counties.

Common Loon

During 1985, the Nongame and Endangered Species Program, Metropolitan District Commission and Massachusetts Audubon Society, received a joint grant from the North American Loon Fund. This grant made possible the hiring of a Loon Warden to gather data on the status, productivity and causes of disturbance to the Common Loon at Quabbin Reservoir. Six pairs of loons were monitored at Quabbin and one at Wachusett Reservoir. Eggs were laid by three of the Quabbin pairs and one chick was hatched.

Great Blue Heron Colony Inventory

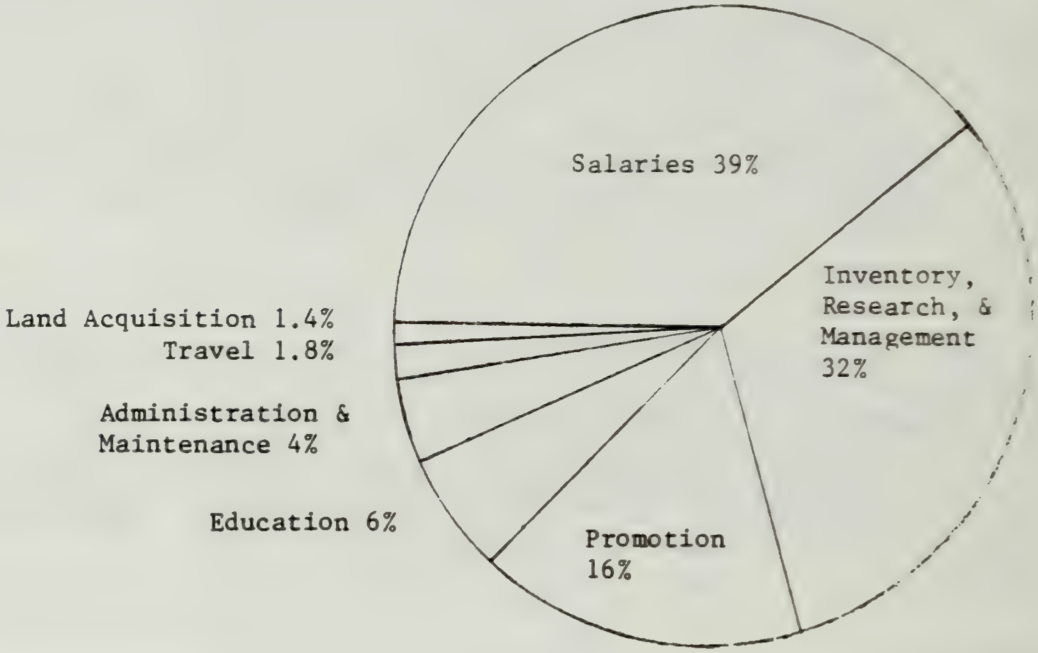
During June 1985, the State Ornithologist conducted an inventory of all known Great Blue Heron colonies in the state. An estimated 308 nesting pairs were counted, continuing the rising trend evident since 1979. These results were up 32% from 1984 and up 61% over 1983. A total of 25 colonies was recorded, of which 15 were located in Worcester County. The largest colonies were in Dunstable (67 pairs) and Phillipston (44). Mean brood size at about 60 days among all colonies was conservatively 2.79 young. Estimated total production was 717 young; up 34% from 1984. Overall results show that the Great Blue Heron continues to flourish in Massachusetts and that productivity and recruitment are excellent.

Bluebird and Purple Martin Management

During Fiscal Year 1985, approximately 250 bluebird houses were built in Division shops. The Demonstration Bluebird Trail at High Ridge Wildlife Management Area in Gardner and Westminster ,begun in 1984, was expanded. This

NONGAME & ENDANGERED SPECIES PROGRAM

FY 1985 EXPENDITURES



Salaries	$ 48,113.
Species Inventory, Research & Mgt.	$ 39,495.
Promotion	$ 20,069.
Education	$ 7,175.
Administration & Maintenance	$ 4,908.
Travel (including advisory committee)	$ 2,259.
Land Acquisition	$ 1,700.
	$ 123,722.

trail is being developed to provide the general public with a place they can visit to actually see bluebirds and to show how a trail is built to attract bluebirds. Five pairs of bluebirds nested in boxes along the trail in 1985.

Studies continued in 1985 to determine the efficiency of installing purple martin house units about the state. As of June 30, 1985, units had been installed at 39 sites. Of these units, six were "support" units at existing colonies, 13 were "satellite" units located within 25 miles of existing colonies and 19 were "prospecting" units located more than 25 miles from known colonies. Utilization has been generally poor. "Support" units enjoyed the best success with 75% utilized to some degree, but none of the 19 "prospecting" units was occupied.

Results thus far seem to show that units are useful in augmenting and strengthening existing colonies, but of little use in expanding the species' range. New colony establishment seems to be an extremely slow process that seems to depend on the vagaries of weather and other natural factors, social factors and just plain chance.

Because of the investment in houses already made, units will continue to be monitored for occupancy. However, production of new units has been suspended.

Bat Studies

During the winter of 1984-85, Division staff visited the Rowe Copper Mine, the Chester Macia Mine and the Old Chester Mine to survey hibernating bat populations and to search for the endangered Indiana bat, Myotis sodalis. A total of 4,047 hibernating bats of four species were counted but no Indiana bats were found. In order of importance the species included Little Brown Myotis (2,903), Keen's Myotis (585), unidentified Myotis (including Little Brown and Keen's - 521), Eastern Pipistrelle (36), and Big Brown Bat (2).

Nongame Fiscal Year 1985 Project Expenditures

Species, Inventory, Research and Management

Bald Eagle - Quabbin release program and winter survey ($10,000 from Bald Eagle Trust Fund)	$12, 860.
Plymouth Red-bellied Turtle - Research, management and Headstarting program	$10,527.
Peregrine Falcon - Boston release program	$ 3,900.
Bats - winter surveys	$ 429.
Bluebird and Purple Martin house construction	$ 97.
Rare species inventories - Mass. Natural Heritage Program - including rare plants and animals	$10,710.

Land Acquisition

Great Blue Heron colony - Dunstable, MA	$ 1,700.

District Reports

Northeast District, Walter L. Hoyt, District Wildlife Manager
Southeast District, Louis Hambly, District Wildlife Manager
Central District, G. Christopher Thurlow, District Wildlife Manager
Connecticut Valley District, Herman Covey, District Wildlife Manager
Western District, Tom Keefe, District Wildlife Manager

The five wildlife districts are the field units of the Division of Fisheries and Wildlife. They work directly on Division properties and serve as the Division's presence throughout the Commonwealth. Staff from the District offices conduct field research under the supervision of project biologists, conduct stocking programs and serve as liaison with sporting and conservation groups. During Fiscal 1985, personnel from all districts released trout, pheasant, quail in the Southeast District, hare, tiger muskies and northern pike in a variety of woods and waters. They operated stations where hunters checked deer and turkey and where trappers registered the pelts they had taken. They distributed licenses, abstracts and other materials to hunting/fishing license sales outlets and they assisted officers from the Division of Law Enforcement in ensuring public adherance to wildlife regulations. In addition, certain Districts conducted special hunts at the Delaney Wildlife Management Area (Northeast), Otis Air Force Base (Southeast), Ludlow Wildlife Management Area (Conn. Valley) and a special deer hunt for paraplegic sportsmen (Western).

Throughout the year, District staff members participated in on-going research efforts such as the mid-winter eagle survey, black duck banding program, the waterfowl inventory, census of mourning doves and woodcock, survey of great blue heron rookeries, monitoring of the mast crop and checking pH levels of ponds and streams. Special surveys brought Western District crews into the field checking streams and ponds for PCB's to assist the Division of Water Pollution Control and to assist a crew from Field Headquarters in the annual bat inventory. Staff from the Connecticut Valley District became involved with research teams from the University of Massachusetts conducting research on black bears. Field crews assisted the wood duck research program by monitoring and maintaining wood duck boxes and Central District staff built and maintained houses of bluebirds establishing a demonstration trail on the Gardner Wildlife Management Area.

As usual, District crews were on hand to assist the public in dealing with issues of animal damage. In this context, staff members provided advice, loaned traps and undertook animal removal operations where beaver were obstructing waterways.

District personnel reviewed the Environmental Monitor for projects having an impact on wildlife, and offered comments where appropriate. They also took part in a variety of training sessions on such objects as animal immobilization, lake drawdowns, acid rain and telemetry.

Crews from both Western and Connecticut Valley Districts participated in the turkey translocation program by scouting potential capture sites, baiting such sites and where birds were taken, assisting in transferring them to their new home area. Western District crews also transported, where they were met by a crew from the Southeast District, pheasant eggs donated to Massachusetts by New York State. The Eagle Restoration Program occupied staff of the Connecticut Valley District during the summer as they assisted in site preparation and gathering food for the young birds. During the same period, District staff members worked weekends with volunteer crews from the Western Massachusetts Chapters of Trout Unlimited, Western Massachusetts Fly Fishermen, and the New England Fly Fishermen to improve the upper section of the Swift River. To date, this effort has paid off in the establishment of four wing deflectors made of logs and stone and the placement of 75 halflog fish shelters. The joint effort has drawn much public interest as reflected by positive press coverage. A new initiative in the Valley involves the formation of a Connecticut Valley Action Program Committee made up of representatives of the 19 cities and towns along the Connecticut River and including among its members the Connecticut Valley District Manager. This group has met to identify problems along the river and gather recommendations for action.

Three new osprey nesting platforms were erected in the Southeast District with assistance from District crews. This district also monitored walleyes which are uncommon in the state. Their survey of Assawompsett Pond netted over 100 fish. Eggs were taken from these fish, fertilized and subsequently returned to the pond to test for viability. Preliminary results indicate that the eggs were fertile and viable.

Crews from the Northeast District expanded their management activities to take in the 2,640 acres in eight communities abutting the Charles River (Charles River Natural Valley Storage Area). Management responsibility for this vital area has been transferred to the Division by the U. S. Army Corps of Engineers.

The majority of the time not spent in research projects was spent in maintenance and improving the wildlife management areas within the Districts with each District having management responsibility for 2,700 acres (Connecticut Valley) to 15,200 acres (Central) of wildlife lands. On these areas, District crews cut back brush and opened fields. In one of the largest operations of the year, crews from the Central District opened 50 acres of old fields on the High Ridge Wildlife Management Area in Gardner. In addition to clearing lands, crews planted shrubs and trees as needed, limed and fertilized, marked boundaries, maintained and repaired bridges, roadways and parking areas. In addition, District personnel serviced transport and field equipment, maintained stream and pond shocking gear, boats and a variety of vehicles. District Managers arranged cooperative agreements with local farmers who were permitted to utilize Division lands in exchange for practices which enhance the fertility of the land and for leaving food and cover crops for wildlife. On other lands, contracts were arranged for selective logging to benefit wildlife and to provide material for Division construction projects. In the Western District, a cooperative agreement was signed to permit a maple sugaring operation on a wildlife management area in exchange for woodland improvements selective cutting and a fee.

While the obligations filled most of the District crews' days, all districts reported an increasing number of public contacts. These ranged from providing technical assitance to such groups as the U.S.D.A., University of Massachusetts, U.S. Army Corps of Engineers, Town Selectmen, and other state agencies as well as to private citizens confronted with animal nuisance or damage problems to staffing of booths at shows, exhibits and fairs.

As in the past, District staff continued to attend public meetings on issues related to wildlife, make press contacts, respond to press inquiries and participate in radio and television programs describing or explaining Division programs.

Information and Education

Ellie Horwitz
Chief
Information and Education

Press Contacts

Communication with the public through the news media continues to be a key function of the Information and Education Section. At this point, coverage of Division activities is good and the number of direct inquiries from both print and electronic reporters is increasing. Fiscal Year 1985 saw a continuation of the upward trend in coverage and use of press releases that has been noted in the past few years. Calculated on a calendar year basis (figures are for calendar year 1984) the section issued 34 press release packets for a total of 164 press release items. These items were sent to a list of 1,500 recipients of which 356 were media representatives while others included 428 sportsmen's clubs, 351 town clerks and a number of sporting goods stores. These releases plus special press events brought a total of 3,901 press clippings or an average of 325 clippings per month. This shows a continued increase over the previous high level of 240 per month (1983).

Special events for the press were hosted on the occasion of: the arrival of six young bald eagles from Nova Scotia and their subsequent release; the arrival of young peregrines; an official announcement of the results of the nongame checkoff; a volunteer effort to upgrade a portion of the Swift River in Belchertown; the Governor's signing of the annual proclamation of National Hunting and Fishing Day (September) and his signing of a similar announcement proclaiming Acid Rain Awareness Week (April), the establishment of a sanctuary for the protection of the endangered Plymouth Red-bellied turtles; and a special "hot-line" to convey up-to-the-minute information on the progress of the deer hunting season.

In addition to these releases and events, section personnel responded to requests for information from writers, reporters and radio/television journalists. Potential tourists as well as interested citizens also requested information and a sizable fraction of staff time was devoted to responding to both telephone and written inquiries.

Publications

Many of the inquiries received were answered with Division publications. As is section practice, all annual publications (abstracts, waterfowl regulations, stocking lists, fishing access information and other routine materials) were updated. Popular publications including fishing map booklets, lists of fauna and natural history flyers were reprinted. Prior to reprinting each publication was reviewed and, where needed, updated. Because of the rush to update and revise existing brochures, no new brochures were prepared, however, a new series of information sheets, inaugurated in Fiscal Year 1984, was expanded. This series, produced in cooperation with the U. S. Fish and Wildlife Service and the Cooperative Extension Service, now includes six natural history titles and three leaflets on recognizing and dealing with animal damage. In view of the growing number of publications, the Division's publications list was enlarged and reissued.

During this period, funds were available for only one issue of Massachusetts Wildlife. The single issue was devoted entirely to the issue of acid rain and examined the effects of acid rain on a wide variety of natural resources. As it appears that budget constraints will not permit the Division to expand publication under the current system, it has become top priority to establish a subscription system and staff members worked closely with the Director to stimulate passage of a bill to permit establishment of such a system and to develop procedures for handling subscriptions should such a system be approved.

Exhibits

As in other years, the Division took part in a variety of shows to increase Division visibility and to bring staff members in contact with the general public. The featured species for the 1984-1985 shows were turkey and trout. As in previous years, Information and Education personnel worked closely with District staff in preparing exhibits for the Eastern States Exposition (Springfield), The Eastern Fishing Exposition (moved from Boxborough to Worcester) and the Springfield Sportsmen's Show (taken on in lieu of the former Boston Travel and Camping Show). District crews used these materials for Regional fairs including Topsfield Fair (Northeast), The Fair in Worcester (Central) -- a show which provided the Division two hours of prime time on WTAG, a major Worcester station, Greenfield Fair (Conn. Valley), and the Bridgewater Sportsmen's Show (Southeast). In addition to these "traditional" shows, the section staff brought a Division presence and exhibit to the annual meeting of the Massachusetts Association of Conservation Commissions and to the New England Environmental Conference.

Hundreds of thousands of visitors passed through these exhibits, purchased licenses, asked questions and became better acquainted with the Division and its activities.

Shows

All members of the section participated in presenting slide shows, seminars and films as appropriate to both general and technical audiences. While programs dealt with all aspects of Division activities, the prime focus was on the activities of the burgeoning Nongame Program and specifically on eagle restoration. Groups requesting such programs included school groups, civic groups, sportsmen's and garden clubs, senior citizen's groups and an increasing number of groups from neighboring states.

Photography

During the year, both photographers continued to increase Division files by photographing and documenting field projects and by creating special graphics for presentations by staff administrators and biologists. While no specific films or slide shows were planned, photographs were taken for possible future programs on Division activities and on coastal nesting birds. Special emphasis has been focussed on obtaining photographs appropriate for nongame fund posters and for brochures which are in preparation or have been projected for future publication.

Special Programs

Nongame and Endangered Species Program

Promotion of the Nongame Wildlife Fund and the associated tax checkoff was the key issue for the Information and Education Section during this year. During the first year of this promotion, efforts had been aimed at rapid production of basic publicity materials and the fund had garnered a total of $338.070.00.

With somehwat more lead time, consultant Joy Merzer compiled a report on first year performance of nongame funds across the nation and determined that Massachusetts came in with returns behind those of only two states, New York and Colorado. Poster and brochure materials were revised, meetings were held with tax preparers, a 30 second television spot was prepared, the slide show was updated and expanded, and appearances were booked for nongame staff members on a wide variety of radio and televisions shows (average 10/mo. during tax season). Special articles were prepared for the newsletters of wildlife and environmental organizations and for the Department of Law Enforcement's newsletter. A nongame fund segment was included in all Division shows and exhibits and a special exhibit on wetlands was prepared for inclusion in the Boston Flower Show. This exhibit was awarded third place among small exhibits. A variety of staff members, including District staff presented programs focussing on the nongame slide show and on the film Home Free, a 27 minute documentary which chronicles the eagle restoration project. This film was selected by Channel 2 for use in its own fund raising effort and, with Division and Audubon staff responding to donors, became the single greatest fund raising program of the year.

Looking ahead, plans were made for promotion in 1985-86, initial meetings were held with potential consultants at the Halyard Group (an advertising group) and at Communications for Learning (producers of television and visual materials). Some investigationswere also initiated to determine companies and groups which match employee contributions as a way to agument fund income.

Following the footsteps of the nongame program, the Department of Public Health successfully establishedasimilar checkoff on the tax form -- this one for organ transplants. Section personnel met with Department of Public Health staff to assist them in setting up their promotional campaign for this fund.

At the close of the fiscal year, consultant Joy Merzer left the program and a search was initiated for a successor with an advertising background.

The Freshwater Sportfishing Awards Program

The program continued to grow with 500+ entries in 20 categories which set six new state fishing records. In a move to standardize regulations, participating stations were required to obtain certified scales for future use. This proved no problem and while a few stations dropped the awards program, others were ready to take their place.

Tags 'n' Trout

This program was continued as in previous years. This year local sponsors sponsored 488 tagged trout at 18 locations offering anglers a donated prize program with a minimum value of $8,700.00 and an actual value which considerably higher. A number of sponsors asked to extend the program into fall fishing. This will be considered for the future.

Waterfowl Stamp Program

The annual competition was again held at the Peabody Museum in Salem. Fifty-five entries were considered before judges selected a Ruddy Duck carved by Joe Lincoln and painted by Randy Julius.

Archery/Primitive Firearms Stamp

This stamp was prepared as a donation to the Division by artist George DiRolf of Shrewsbury whose design involves the point and fletching of an arrow.

Massachusetts Junior Conservation Camp

As in the past, the section was heavily involved with the Massachusetts Junior Conservation Camp, which is now an independent entity operated by the Massachusetts Junior Conservation Camp, Inc. Division involvement ranges from preparation and distribution of publicity, registration of campers, participation on the camp board in an ex-officio capacity, making arrangements for the actual camp session and teaching both fisheries and wildlife sessions.

Project WILD

After much consideration, the Division committed the necessary funds to become a partner in Project WILD. Following this, an educational coalition was established with the Massachusetts Audubon Society which will co-sponsor the program and assist in its distribution. An advisory committee of educators was established and initial workshops were held, one to train teachers and one to train future facilitators. To aid in publicity, a brochure and a sampler were designed and printed, and articles about the program were prepared for the newsletter of the American Nature Study Society and for the Journal of the Massachusetts Science Teachers Association.

Wildlife Projects

Section staff members continued their participation in projects outside the information area with photographer Jack Swedberg taking the lead in the Division's eagle restoration program (detailed in the nongame section) with photographer Bill Byrne deeply involved in assisting on the project. Jack was honored for his efforts as Man of the Year by the Eagle Foundation and Home Free was selected as an outstanding Film of the Year by The Wildlife Society. Journalist Peter Mirick coordinated part of the statewide survey of salamanders and continued to serve as consultant on herpetological matters, while section leader Ellie Horwitz continued to participate in survey and inventory of bats.

Other

Numerous other projects rounded out the section's activities and involved staff members in many facets of Division activities. During this year, the Division Policy was finally completed and readied for final editing and publication. To accompany this document, a "mission statement" was also prepared for Division use.

A storage area was prepared for museum materials, a complete inventory was conducted, and new cases were constructed to increase display space. Intern Michael Picchieri cleaned and restored the museum's bird mounts under the direction of staff from The Worcester Science Center.

Intern Cindy Slocum assisted the section providing art and graphics for brochures and displays from February 1985 through the end of this fiscal year.

Section Chief Horwitz and Journalist Peter Mirick served as awards committee for the Northeast Outdoor Writers Association. Horwitz also served on the Education Committee of The Wildlife Society and as Northeast Liaison for the Association of Conservation Information.

Realty

Floyd Richardson
Chief of Wildlife Lands

Funding made available by Chapter 723 MGL opened new horizons for the Realty Section. Unbridled latitude in acquisition endeavors presented the Division with the opportunity to acquire: lands adjacent to existing wildlife management areas; lands adjacent to major rivers; rare, threatened or endangered species habitat; coldwater streams; and other lands determined to be threatened.

The benefits the public will realize from the above-mentioned programs of acquisition will be immeasurable. The majority of lands described herein are lands acquired with this open-space monies.

Phillipston Acquisition Project 3,229.5 Acres

This unique management area has provided countless hours of enjoyment to sportsmen and "out-of-doors" enthusiasts alike. Benefits include cross-country skiing on the numerous wooded roads that spider webthe area, berry picking where the silence is punctuated only by song birds, and grouse exploding from a thicket when you least expect it.

As the Division entered this fiscal year, the threat of development focused on the western perimeter of this unspoiled area. Three hundred acres and 3,500 feet of Williamsville Road frontage were in danger of being developed. Fortunately, the owner enjoyed wildlife and appreciated wildlife lands. He refused a lucrative offer from a developer and sold to the Division at a considerably lower price.

High Ridge Acquisition Project 1,795.7 Acres

A comparatively new management area, High Ridge is maturing into a compatible wildlife area. Additional acquisitions are becoming increasingly difficult because of the proximity of a community developing rapidly both industrially and residentially. The construction and completion of Route 190, a direct route from central Worcester, is the major factor contributing to the increased growth rate.

Despite these pressures, the Division has acquired a twelve (12) acre parcel, lending additional food and wildlife cover adjacent to Smith Street.

Fox Den Acquisition Project 748.0 Acres

Two large acquisitions created a new wildlife management area in the Town of Worthington, County of Hampshire. The combination of these two acquisitions place 748 acres of woodlands in Division ownership.

Ownership, which originates on West Street, runs westerly over undulating topography to the Middle Branch of the Westfield River. Hardwood trees -- oak, maple, beech, ash and birch with softwood stands of pine, hemlock and spruce -- comprise the woody plants. Remnants of apple orchards are scattered throughout the area.

This picturesque hilltown has become a popular residential development. Unfortunately, development spells destruction of wildlife habitat, so these acquisitions come at a most opportune time.

Hinsdale Flats Acquisition Project 1,219.7 Acres

Seventy-two acres of wildlife habitat were added to this management area which extends from the Washington/Hinsdale town line to the Middlefield Road. The East Branch of the Housatonic River, in its serpentine pattern, graces the area providing habitat for waterfowl, aquatic mammals, and trout.

Birch Hill Acquisition Project 3,179.6 Acres

The Division owes a debt of gratitude to the officials of the Town of Winchendon who made this 82 acre acquisition possible. Their concern for the environment coupled with their determination and effort to place this land in public ownership was responsible for these lands being deeded to the Division.

Birch Hill has long been a favorite hunting and fishing area. Open fields, hedgerows, woodlands, and marshlands blend to provide a well-balanced wildlife area. Two well-stocked trout streams complete the area.

Bolton Flats Acquisition Project 740.9 Acres

A triangular parcel of woodland, fronting Route 117 in Lancaster, was acquired to add another seven acres to the popular Bolton Flats Management Area.

Land adjacent to this area, potentially available, is relatively scarce and expensive. Future acquisitions are expected to be difficult.

Elbow Meadow Acquisition Project 5.0 Acres

This area is considered one of the largest Great Blue Heron rookeries in Massachusetts. Encroaching residential development and the loss of remoteness necessary for this rookery spelled disaster. Concern for the well-being of the rookery precipitated an acquisition plan developed cooperatively with the Dunstable Conservation Commission. The plan to create a protective buffer zone was formulated. An 83-acre parcel was acquired by the town and the Division added a five acre parcel. Funding from the Nongame Income Tax Checkoff proceeds made this first acquisition possible.

Quaboag Acquisition Project 1,101.4 Acres

Four new parcels of river front property were placed in Division ownership. These parcels ensure permanent protection of that segment of the Quaboag River. They comprise 55.8 acres and are located both in Brookfield and West Brookfield.

With the above-mentioned acquisitions, approximately five miles of Commonwealth ownership on the river is realized.

North Attleboro Federal Hatchery Project 36.46 Acres

Title to a thirty-six and one-half acre parcel of land was vested into the Division. This transaction without cost is considered a transfer resulting from a "reverter clause" in a deed of the Commonwealth to the United States Fish and Wildlife Service.

Language in the deed explicity instructs and directs the return of any portion of the conveyed premises no longer utilized for propagation of fish. Route 95 cut off a segment of the hatchery. This isolated property is no longer an integral part of the hatchery, thus precipitating the transfer.

Maintenance and Development

John P. Sheppard
Chief
Maintenance and Development

Hatcheries

Work was completed on the construction of the wastewater treatment facility at the McLaughlin Hatchery, Belchertown. An existing well was redeveloped at the East Sandwich Anadromous Fish Hatchery. A new boiler and oil burner unit were installed at the residence at the Palmer Hatchery and new vinyl siding was installed at the residence at the Sunderland Hatchery. Also a new 8" PVC water line was installed at the Sandwich Hatchery.

Hunter Safety Building - Gardner, Massachusetts

A new roof was installed at the aforementioned building and extensive renovations were undertaken on the outside of the building including vinyl siding.

Public Access Projects

(1) New plantings at the Lake Quinsigamond boat ramp in Shrewsbury.

(2) Design development started on canoe and cartop boat ramp at North Pond - Hopkinton.

(3) Concrete slab installed and miscellaneous repairs conducted at Monponsett Pond in Halifax.

(4) Concrete slab installed and repairs conducted at Big Alum Pond in Sturbridge.

Personnel Actions

Eighteen personnel changes were undertaken during this fiscal year. They are:

Appointments

Name	Job Title	Date
S. Williams	Game Biologist, Westboro	02/24/85
A. Cancellieri	Principal Bookkeeper, Boston	03/10/85
J. Sousa	Assistant Fish Culturist, McLaughlin	04/01/85
J. Scanlon	Junior Planner, Westboro	05/13/85
E. Ramey	Sandwich Game Farm, Sandwich	06/03/85
S. Shea	Senior Bookkeeper, Boston	06/30/85
K. Miller	Senior Clerk, Boston	05/05/85
J. Ayre	Junior Bacteriologist, McLaughlin	09/09/84

Retirements

Name	Job Title	Date
S. Curtis	Conservation Skilled Helper, Southeast	07/15/84
A. Kleinoit	Chief Administrative Clerk, Boston	06/30/84
C. Ellison	Fish Culturist, Bitzer Hatchery	11/02/84
R. Deane	Conservation Skilled Helper, Bitzer	03/31/84
J. McDonough	Game Biologist, Westboro	10/19/84

Resignations

D. Spigarolo	Junior Bacteriologist, McLaughlin	08/01/84
E. Robidoux	Senior Clerk, Boston	04/19/85
D. Rose	Conservation Helper, Western District	04/16/85
P. Sutliff	Senior Bookkeeper, Boston	05/17/85

Transfer

M. Magenghi	Senior Bookkeeper to Junior Clerk Typist on a half-time basis.	03/31/85

Legislation

Enacted During Fiscal Year 1985

Chapter 77 - Acts of 1985. An act further regulating public access to information in the Massachusetts Natural Heritage Program Data Base.

Chapter 95 - Acts of 1985. An act imposing administrative penalties for certain environmental violations.

Chapter 130 - Acts of 1985. An act authorizing the transfer of the care, custody and control of certain parcels of lands in the Town of Bourne from the Division of Fisheries and Wildlife and the Buzzards Bay Water District to the Department of Public Works for highway purposes.

Chapter 197 - Acts of 1985. An act increasing the penalties for the dumping of rubbish on public land, in or near coastal or inland waters or on the property of another.

Chapter 219 - Acts of 1985. An act allowing for a turkey hunting season in a certain area of the Mount Greylock State Reservation.

Chapter 231 - Acts of 1985. An act relative to the Division of Law Enforcement, Department of Fisheries, Wildlife and Environmental Law Enforcement.

Chapter 254 - Acts of 1985. An act further regulating commercial shooting preserves.

Chapter 329 - Acts of 1985. An act authorizing the shooting of certain wounded migratory game birds from a powered boat.

Chapter 349 - Acts of 1985. An act further regulating the carrying of dangerous weapons.

Chapter 435 - Acts of 1985. An act authorizing the Towns of Dracut and Tyngsboro to enter into an agreement with the Town of Pelham in the State of New Hampshire for the purpose of watershed management and lake restoration for Long Pond.

Chapter 483 - Acts of 1985. An act authorizing the reproduction of the Fuertes Bird Paintings.

Chapter 528 - Acts of 1985. An act authorizing DCPO to permit the General Electric Company to transfer certain easements in land of the Commonwealth.

Chapter 573 - Acts of 1985. An act relative to certain capital outlays. (Section 12 amends land acquisiton bill by obligating the general fund rather than the Division of Fisheries and Wildlife).

Chapter 590 - Acts of 1985. An act limiting acid rain and acid disposition.

Chapter 630 - Acts of 1985. An act relative to fees for issuing hunting and fishing licenses (clarifies section 17 of Chapter 131).

Chapter 734 - Acts of 1985. An act relative to the Quabbin Watershed Advisory Committee of the MDC.

Chapter 756 - Acts of 1985. An act establishing the Lake Buel Restoration/ Preservation District in the Towns of Monterey and New Marlborough.

Chapter 767 - Acts of 1985. An act relative to certain dams.

Chapter 770 - Acts of 1985. An act authorizing use of the Division of Fisheries and Wildlife Nongame Wildlife Fund to acquire other than fee interests in certain property.

How the Sportsman's Dollar is Spent

COMMONWEALTH OF MASSACHUSETTS
DIVISION OF FISHERIES AND WILDLIFE
July 1, 1984 to June 30, 1985

	Account No.	Expenditures		Percentage
Administration				
Administration	2310-0200	$ 494,263.75		
Information-Education	2310-0200	243,443.34	$ 737,707.09	13.03%
Wildlife Programs				
Game Farms	2310-0400	673,795.73		
Wildlife Management**	2310-0400	762,789.83		
Wildlife Cooperative Unit	2310-0400	72,000.00	1,508,585.56	26.64%
Fisheries Programs				
Fish Hatcheries	2310-0400	847,886.66		
Fisheries Management**	2310-0400	650,273.82		
Fisheries Cooperative Unit	2310-0400	72,000.00	1,570,160.48	27.72%
Construction				
Development & Improvement of Facilities for Public Use*	2310-0300		82,079.15	1.45%
Land Acquisition				
Acq. of Upland Areas & Inholding on Existing Areas* **	2310-0310		171,366.06	3.03%
Equipment				
Purchase of Equipment	2310-0315		187,742.25	3.31%
Dept. of Fisheries, Wildlife & Recreational Vehicles				
Natural Resource Officers' Salaries and Expenses (15%)	2350-0100		330,875.52	5.84%
Hunter Safety Training***	2350-0101		182,524.75	3.22%
Transfers from Fund				
Group Insurance	1590-1007		218,294.00	3.85%
Salary Adjustments	2310-7001		64,467.00	1.14%
Central Reproduction			1,063.74	.02%
Retirement Assessment (.2%)	0612-1000		381,091.82	6.73%
Interest on Bonded Debt	0699-2800		33,231.50	.59%
Maturing Serial Bonds & Notes	0699-2900		194,000.00	3.43%
TOTAL EXPENDITURES			$5,663,188.92	100.00%

* Continuing Appropriation
** Portions of expenditures up to 75% reimbursable by Federal Government
*** 100% reimbursable by Federal Government

APPROPRIATIONS AND EXPENDITURES
Fiscal Year July 1, 1984 to June 30, 1985

Inland Fish and Game Fund Accounts

Account No.		Appropriations	Expenditures & Liabilities	Total Reversions
2310-0200	Administration	787,193.00	737,707.09	49,485.91
2310-0315	Purchase of Equipment	271,713.00	187,742.25	83,970.75
2310-0400	Wildlife Management	3,300,085.00	3,078,746.04	221,338.96
		4,358,991.00	4,004,195.38	354,795.62

		Continuing Appropriations	Expenditures	Balance Forward
2310-0300	Dev. & Imp. of Facilities for Public Use	138,417.10	82,079.15	56,337.95
2310-0310*	Acq. of Upland Areas & In-holding on Existing Areas	268,687.09	131,503.70	137,183.39
		407,104.19	213,582.85	193,521.34

		Capital Outlay Appropriation	Expenditures	Balance Forward
2670-9016	Acq. of Coastal & Inland Wetlands	5,545.49	1,604.50	3,940.99

General Fund Accounts

Account No.		Appropriations	Expenditures & Liabilities	Total Reversions
2310-0500	Natural Heritage & Greenway Planning	185,000.00	161,363.29	23,636.71
2310-0550	Acid Rain Program	333,000.00	325,874.00	7,126.00
2310-0551	Acid Rain Research	86,500.00	7,500.00	79,000.00
		604,500.00	494,737.29	109,762.71

		Continuing Appropriation	Expenditures	Balance Forward
2310-0310*	Acq. of Upland Areas & In-holding on Existing Areas	89,562.36	43,834.57	45,727.79

		Capital Outlay Appropriations	Expenditures	Balance Forward
2310-8821	Wastewater Treatment Facility, McLaugh. Hatch.	728,192.77	491,470.55	236,722.22
2310-8840	Acq. of Cold Water Streams	3,760,000.00	-	3,760,000.00
2310-8841	Associated Costs	240,000.00	-	240,000.00
2310-8842	Acq. Adjacent to Existing Wildlife Mgmt. Areas	7,050,000.00	-	7,050,000.00
2310-8843	Associated Costs	450,000.00	-	450,000.00
		12,228,192.77	491,470.55	11,736,722.22

Nongame Wildlife Fund Account

		Appropriation	Expenditures & Liabilities	Total Reversions
2315-0100	Nongame Program	298,207.00	192,159.14	106,047.86

Trust Fund Account

		Appropriation	Expenditures	Balance Forward
2310-6004	Bald Eagle Trust	9,443.93	4,997.94	4,445.99

*75% Inland Fish and Game Fund; 25% General Fund.

SUMMARY OF REVENUE CREDITED
TO THE
INLAND FISH AND GAME FUND
July 1, 1984 to June 30, 1985

Collected by Agency:	Receipt Acct. No.	Amount
Fishing, Hunting and Trapping Licenses*	3304-61-01-40	$3,923,552.98
Archery Stamps*	3304-61-01-40	111,262.60
Trap Registrations*	3304-61-01-40	1,374.00
Waterfowl Stamps*	3304-40-01-40	6,093.60
Waterfowl Stamps-Ducks Unlimited*	3304-40-02-40	19,490.40
Special Licenses, Tags & Posters**		17,126.00
Antlerless Deer Permits	3304-61-14-40	39,104.00
Bear Permits	3304-61-14-40	4,390.00
Turkey Permits	3304-61-14-40	25,150.10
Rents	3304-63-01-40	18,173.95
Sales, Other	3304-64-99-40	28,778.96
Refunds Prior Year	3304-69-01-40	3,248.46
Miscellaneous Income	3304-69-99-40	455.61
		$4,198,200.66
Collected by State Treasurer:		
Fines and Penalties	3308-41-01-40	34,111.85
Interest and Discount on Revenue	3395-60-01-40	101,156.18
		$135,268.03
Federal Aid Reimbursement:		
Pittman-Robertson	3304-67-01-40	650,865.86
Dingell-Johnson	3304-67-02-40	305,370.44
Anadromous Fish Projects	3304-67-04-40	15,113.74
Endangered Species	3304-67-11-40	6,916.67
Indirect Cost Reimbursement	3304-67-67-40	326,835.61
		$1,305,102.32
Taxes:		
Gasoline Tax Apportionment	3312-05-01-40	385,121.52
Transfers from General Fund		
Salary Adjustments	3360-95-02-36	65,531.00
Reimbursements on Half Price Licenses	3360-95-08-40	69,491.75
		$135,022.75
Reversions		
Accounts Payable		88,951.40
TOTAL REVENUE		$6,247,666.68

DIVISION OF FISHERIES AND WILDLIFE
RECEIPTS FROM FISHING, HUNTING AND TRAPPING LICENSES
Fiscal Year July 1, 1984 to June 30, 1985

Detail Sheet #1

Class & Type of License	Unit Price	Quantity	Gross Amount	Fees Retained by City/Town Clerks	Net Returned to Commonwealth
01 Res. Cit. Fishing	12.50	146,188	1,827,350.00	44,349.00	1,783,001.00
02 Res. Cit. Hunting	12.50	46,287	578,587.50	17,190.00	561,397.50
03 Res. Cit. Sporting	19.50	60,266	1,175,187.00	20,613.00	1,154,574.00
04 Res. Cit. Minor Fishing	6.50	8,442	54,873.00	2,902.00	51,971.00
05 Res. Alien Fishing	14.50	1,344	19,488.00	464.00	19,024.00
06 Non-Res. Cit./Alien Fishing	17.50	6,457	112,997.50	1,946.00	111,051.50
07 Non-Res. Cit./Alien Fishing (7da.)	11.50	2,577	29,635.50	721.50	28,914.00
08 Non-Res. Cit./Alien Hunting (Small Game)	23.50	1,150	27,025.00	448.00	26,577.00
09 Non-Res. Cit./Alien C.S.P. (3 da.)	19.50	15	292.50	5.00	287.50
10 Res. Cit. Minor Trapping	8.50	149	1,266.50	59.50	1,207.00
11 Res. Cit. Trapping	20.50	881	18,060.50	372.00	17,688.50
12 Duplicates	2.00	3,622	7,244.00	-	7,244.00
13 Res. Alien Hunting	19.50	1,131	22,054.50	472.00	21,582.50
14 Non-Res. Cit./Alien Hunting (Big Game)	48.50	1,260	61,110.00	488.00	60,622.00
15 Res. Cit. Sporting (Over 70)	FREE	20,863			
16 Res. Cit. Fishing (Blind-Para.-Ment. Ret.)	FREE	1,396			
17 Res. Cit. Hunting (Paraplegic)	FREE	172			
18 Res. Cit. Fishing (Age 65-69)	6.25	6,435	40,218.75	2,816.00	37,402.75
19 Res. Cit. Hunting (Age 65-69)	6.25	694	4,337.50	317.00	4,020.50
20 Res. Cit. Sporting (Age 65-69)	9.75	2,966	28,918.50	1,301.50	27,617.00
21 Res. Cit. Trapping (age 65-69)	10.25	54	553.50	23.50	530.00
24 Non-Res. Trapping	300.00	2	600.00	-	600.00
		312,351	4,009,799.75	94,488.00	3,915,311.75
22 Archery/Primitive Firearms Stamps	5.10	22,131	112,868.10	1,605.50	111,262.60
*Trap Registrations			1,374.00	-	1,374.00
Collections on Delinquent Accounts			4,564.35	-	4,564.35
June remittance overages refunded in subsequent fiscal year			4,010.00	-	4,010.00
Robery-Town Clerk's Office			-333.12	-	-333.12
		334,482	4,132,283.08	96,093.50	4,036,189.58
23 Waterfowl Stamps	1.25	23,585	29,481.25	4,726.75	24,754.50
Waterfowl Stamps (Collectors)			829.50	-	829.50
		358,067	4,162,593.83	100,820.25	4,061,773.58

*Trap Registrations:

Initials	58 @ $4.00	232.00
Renewals	458 @ $3.00	1,140.00
Duplicate	1 @ $2.00	2.00

Detail Sheet #2

SPECIAL LICENSES, TAGS AND POSTERS

July 1, 1984 to June 30, 1985

Receipt Account	Type of License	Quantity & Unit Price	Amount	Receipt Account Total
3304-61-02-40	Fur Buyers			
	Resident Citizens:	23 @ 25.00	575.00	
	Non-Residents or Aliens:	4 @ 75.00	300.00	875.00
3304-61-03-40	Taxidermists	77 @ 20.00		1,540.00
3304-61-04-40	Propagators			
	Special Purpose Permits:	209 @ 1.00	209.00	
	Class 1 (Fish)			
	Initials:	39 @ 15.00	585.00	
	Renewals:	163 @ 10.00	1,630.00	
	Class 3 (Fish)			
	Initials:	18 @ 15.00	270.00	
	Renewals:	78 @ 10.00	780.00	
	Class 4 (Birds, Reptiles, Mammals)			
	Initials:	56 @ 15.00	840.00	
	Renewals:	371 @ 10.00	3,710.00	
	Class 6 (Dealers)			
	Initials:	15 @ 15.00	225.00	
	Renewals:	52 @ 10.00	520.00	
	Additional Stores:	214 @ 5.00	1,070.00	
	Class 7 (Individual Bird or Mammal)			
	Initials:	1 @ 5.00	5.00	
	Renewals:	13 @ 2.00	26.00	
	Importation Permits			
	Fish:	3 @ 7.50	22.50	
	Birds:	65 @ 7.50	487.50	
	Class 9 (Falconry)			
	Masters:	14 @ 25.00	350.00	
	Apprentices:	25 @ 25.00	625.00	
	General:	14 @ 25.00	350.00	
	Class 10 (Falconry)			
	Raptor Breeding:	10 @ 10.00	100.00	
	Class 11 (Falconry)			
	Raptor Salvage:	22 @ 1.00	22.00	11,827.00
3304-61-05-40	Take Shiners	99 @ 10.00		990.00
3304-61-06-40	Field Trial Licenses	38 @ 15.00		570.00
3304-61-07-40	Taking of Eels	4 @ 25.00		100.00
3304-61-08-40	Quail for Training Dogs			
	Initials:	3 @ 7.50	22.50	
	Renewals:	13 @ 5.00	65.00	87.50
3304-61-10-40	Comm. Shooting Preserves	6 @ 50.00		300.00
3304-61-12-40	Mounting Permits	3 @ 2.00		6.00
3304-61-13-40	Special Field Trial Permits	12 @ 15.00		180.00
3304-64-01-40	Tags and Posters			
	Game Tags:	3,905 @ .10	390.50	
	Fish Tags:	5,200 @ .05	260.00	
	Posters	-	-	650.50
				17,126.00

CHANGES IN
INLAND FISH AND GAME FUND BALANCE

Balance July 1, 1984 (Surplus)	$ 281,639.85
Total Revenue/Credits	6,247,666.68
Total Expenditures	-5,663,188.92
*Increase in Continuing Accounts Brought Forward	-104,908.18
Balance June 30, 1984 (Surplus)	$ 761,209.43

Continuing Accounts Brought Forward	1984	1985
Retirement Assessment (0612-1000)	$24,028.29	$ -5,383.53
Develop & Improve Facilities for Public Use (2310-0300)	57,236.07	39,454.22
Acq. of Upland Areas and Inholding on Existing Areas (2310-0310)	1,665.27	133,390.08
Reserve for Encumbrances	.75	20,377.79
	$82,930.38	$187,838.56

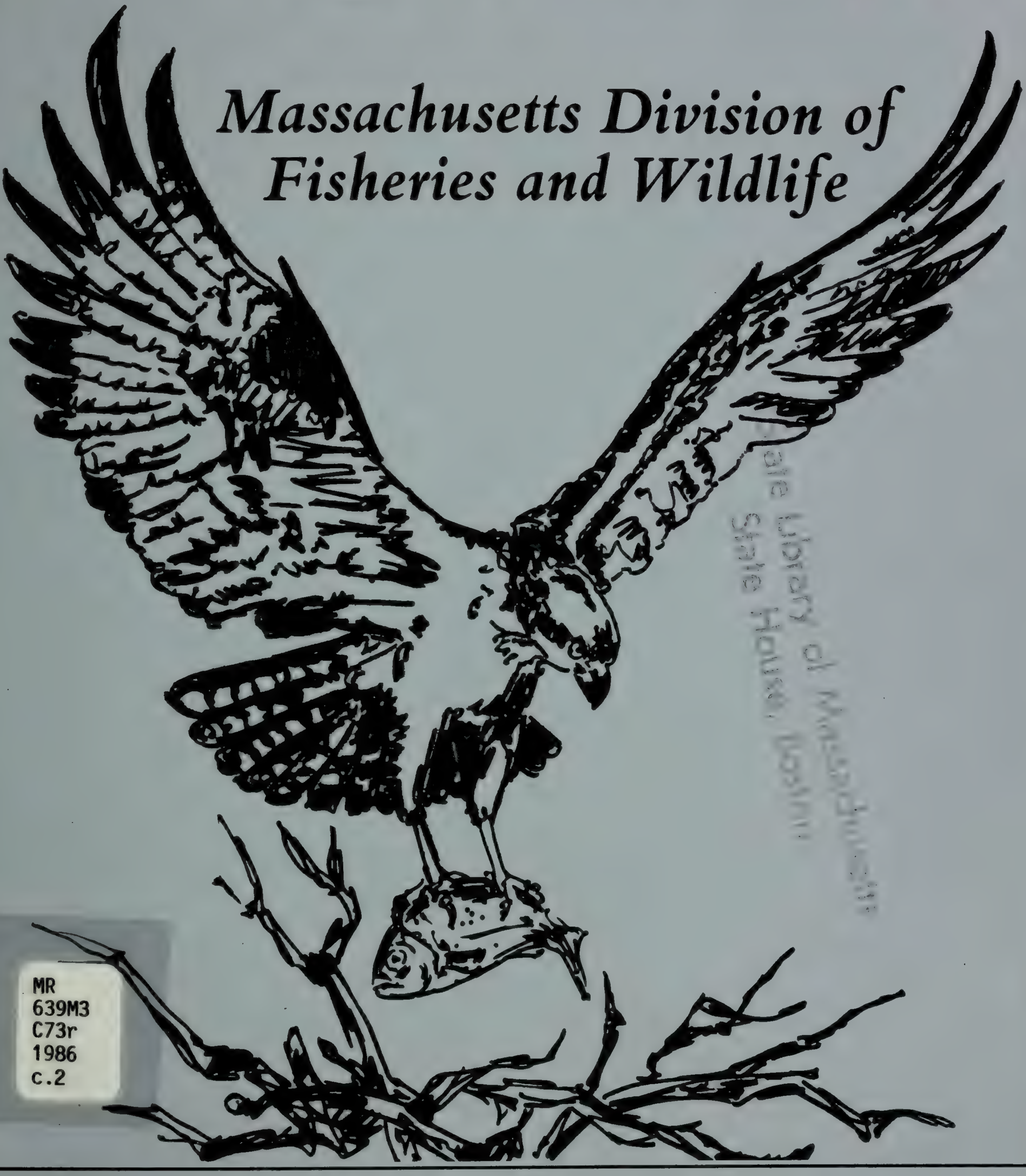
1985:	$187,838.56
1984:	-82,930.38
	*$104,908.18

CHANGES IN
NONGAME WILDLIFE FUND BALANCE

Balance July 1, 1984 (Surplus)	$338,070.46
Total Revenue/Credits	264,642.89
Total Expenditures	-192,159.14
Balance on June 30, 1985	$410,554.21

1986 Annual Report

Massachusetts Division of Fisheries and Wildlife



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Division of Fisheries and Wildlife
Leverett Saltonstall Building, Government Center
100 Cambridge Street, Boston 02202

DIRECTOR

His Excellency, Michael S. Dukakis, Governor of the Commonwealth, the Executive Council, the General Court, and the Board of the Division of Fisheries and Wildlife.

Sirs:

I have the honor to submit herewith the One Hundred and Twenty-First Annual Report of the Division of Fisheries and Wildlife, covering the fiscal year 1 July 1985 to 30 June 1986.

Respectfully submitted,

Wayne F. MacCallum

Wayne F. MacCallum
Acting Director

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Highlights of 1986

Nineteen eighty-six was marked by the advent of some significant new programs, the expansion of existing programs and authorization for certain key new programs.

New programs initiated during this year include a new forestry/wildlife program headed by John Scanlon, formerly a consulting forester for Bay State Forestry Service, and the establishment in Massachusetts of Project WILD, a classroom-oriented wildlife program suitable for Grades K-12.

Programs expanding are lead by the land acquisition program. During this year, the legislature and Governor approved a capital outlay of 11.5 billion dollars for land purchase. To meet this mandate, a realty staff member was added to each wildlife district. By the end of the reporting period, the staff had increased Division holdings by 1,156 acres. The salmon restoration program was enhanced by the opening of a fish passageway at Lowell on the Merrimack River and by the signing of a comprehensive plan for the management of anadromous fish species on the Merrimack. This plan calls for the development of five fish passages at five dams. The deer program hit a new high in the 1985 season with hunters taking a total of 5,289 deer. Press coverage also set records as newspapers around the state responded to Division press releases, programs and events by printing an average of 374 news items each month or an estimated 12 items about the Division, Division programs, or Division personnel each day.

Looking ahead, the Division will move in some new directions. Land acquisition will increase as a result of the bond issue. In order to reduce Division expenses, approval was obtained to place Massachusetts Wildlife on a subscription basis. Following an initial outlay for Fiscal Year 1987, the magazine should become self-supporting. Another new program will see the Division moving into the wildlife art field as the Legislature has authorized the Division to prepare and sell prints made from the art of Louis Agassiz Fuertes which is housed in the Commonwealth archives.

The outlook for the Division's restoration programs is promising. One shorebird, the piping plover, was granted endangered status during this year and now enjoys the protection such listing entails.

During this year we note, with sadness, the passing of Herman Wiesner, who died on January 6, 1986 during the performance of his management and maintenance responsibilities.

The Board Reports

George Darey
Chairman

The Massachusetts Fisheries and Wildlife Board is charged with the responsibility of establishing regulations for the perpetuation, utilization and conservation of wildlife throughout the Commonwealth. In addition, the Board provides oversight of the activities of the Division of Fisheries and Wildlife, authorizes its activities and endeavors to assist Division administrators in streamlining Division functions. The seven unpaid members of this Board address their responsibilities through monthly working meetings which are held in various locations around the state to facilitate public access to the Board and its activities. At these meetings, the Board solicits biological input from staff of the Division of Fisheries and Wildlife, considers public testimony on regulatory matters and examines a wide variety of materials relevant to the subjects under consideration.

During Fiscal 1986, the Board held 13 working meetings and seven (7) public hearings on regulatory matters. They also promoted six informational meetings relating to deer management (2), the Nongame program (3) and a proposal to introduce white amur to Massachusetts (1). In addition, they obtained in-depth briefings on numerous Division programs and they discussed and considered a wide variety of issues relevant to Division operations, wildlife-related requests and environmental issues in the Commonwealth.

Two issues high on the Board's list of priorities, held over from 1985, were to establish the Division's magazine, MASSACHUSETTS WILDLIFE, on a subscription basis in a move toward allowing the publication to become self-supporting and to improve forest management on Division-held properties and where possible, generate income from the sale of timber on such lands. Both of the goals were realized during this year.

In July 1985, the legislature authorized a one-time expenditure to permit the Division to revise the magazine and establish a subscription system. The first subscription issue was published a year later and sent to an initial 5,000 subscribers. Also during that month, wildlife forester John Scanlon joined the Division and began surveying wildlife management areas in the Western District and conducting inventory on those areas.

This was the year in which the Board first grappled with the issue of the federal mandate to utilize non-toxic shot for waterfowl. To make this transition feasible, the Board directed the Division to introduce legislation allowing larger shot sizes than those currently permitted. The Board also took a strong stand on the issue of the number of hunting days allowed Massachusetts waterfowlers. On three occasions, letters were sent to the U. S. Fish and Wildlife Service requesting extra days in lieu of days lost to the Commonwealth's "No Sunday Hunting" provision.

A major item for consideration during this year was the possibility of introducing the white amur or some hybrid from thereof to serve as a weed control agent in selected waters and specifically in Lake Chebacco, Essex. This item was discussed in depth during six of the thirteen working sessions. At the conclusion of the June discussion, the Board voted to continue to investigate the feasibility of using the white amur and to evaluate proposals on a pond-by-pond basis.

The Board also addressed the issue of PCB contamination of portions of the Housatonic River. The Board received copies of a report issued by General Electric detailing options for the cleanup of the contaminants. In reviewing these options, the Board expressed concern that certain ones would contain the contamination but would destroy important wildlife habitat and impact local fish and wildlife. The Division was specifically concerned as a major landowner along that section of river and generally concerned in its role as monitor of wildlife populations.

The proposed establishment of microwave towers adjacent to Hawley State Forest, as part of the Air Force's GWEN System, also posed a threat to key wildlife habitat. Members of the Board visited the area and considered alternatives prior to opposing the proposal.

Issues relating to operation of the Division involved concern with the existing salary scale, one of the lowest in the nation, and led to Board concern about the Division's ability to retain staff, especially upper management. Housing for Division staff became an issue when the state mandated that rates on housing located on state-owned properties be set at fair market rates. As this did not consider the oversight and emergency service responsibilities of employees currently in such housing, it appeared that the ruling might adversely affect security and safety at hatcheries and game farms. Vehicles came under Board scrutiny when the Department of Administration and Finance proposed to conduct all auction/sales of used state vehicles and deposit funds from such sales into the general fund. This was resolved and revenues from the sale of used Massachusetts Division of Fisheries and Wildlife vehicles will be deposited in the Inland Fish and Game Fund. Concern was raised over the possible need for an increase in license fees. This was averted by savings affected by placing the magazine on subscription, by a substantial saving in game farm operations, and by an increase in license sales during Fiscal Year 1985. An additional financial problem was averted when Division administrators arranged continuation of federal funding to this agency despite federal concerns over procedures in other agencies which, under the block funding methods currently in use, could have curtailed disbursement of federal funds.

Other concerns which occupied the Board's attention included an investigation into regulations of the Division of Forests and Parks as they might affect hunting or trapping along the Appalachian Trail and response to a complaint filed regarding a research project on diamond-backed terrapins.

At the Board's request, updatings were provided by Division staff on forestry and habitat improvement on wildlife management areas, on the Division's publicity program and four updatings were provided on the status and progress of MASSACHUSETTS WILDLIFE, a review of falconry regulations and a briefing on the history of the fee and the permit system for furbearer trapping.

Issues Presented at Public Hearings Were:

(1) Waterfowl regulations and consideration of issues relative to non-toxic shot. This is an annual hearing to set season dates and regulations. Seasons were set.

(2) A proposal relative to the hunting of coyotes and the sale of their pelts. The Board rejected the proposal to open coyote hunting during the shotgun deer season, retained existing regulations and requirements.

(3) A proposal to extend the area open to turkey hunting.

(4) A proposal to change regulations pertinent to deer hunting in Ipswich and Essex. (Accepted)

(5) A proposal to permit the trapping of coyotes, two hearings (at the request of the Massachusetts Trappers Association). (Rejected)

(6) A proposal relative to the use of Conibear traps, two hearings (at the request of the Massachusetts Trappers Association). (Proposal referred to study)

(7) A proposal to change regulations pertaining to the harvesting of beaver and muskrat, two hearings (at the request of the Massachusetts Trappers Association). (Rejected)

(8) A proposal to revise and clarify regulations pertaining to the possession and maintenance of wild animals. Two hearings held on this issue. (Accepted)

(9) A proposal to establish additional catch-and-release fishing areas in the Commonwealth, two hearings.

Accepted:	Portions of the East Branch of the Westfield River, the Deerfield River, the Swift River and the entirety of the Quashnet River.
Rejected:	The Quinepoxet River
Tabled:	The Mashpee River and Higgins Pond

(10) A proposal to regulate fishing tournaments, two hearings. (Tabled)

(11) A proposal to close Whetstone Brook to fishing, two hearings. Fish populations have declined dramatically in Whetstone Brook over the past 20 years; a change which may be attributable in part to acidification. Over a five-year period, the Division will conduct a study to determine the effects of an experimental technology in mitigation of the effects of acid conditions in streams. (Accepted)

Other Actions Taken by the Board Included:

A vote to oppose establishment of microwave towers in Hawley.

Selection of format and frequency for the new MASSACHUSETTS WILDLIFE.

Acceptance of a proposal to initiate a fawn mortality study through the Cooperative Wildlife Research Unit.

Issuance of a letter of reprimand to the project leader of a study on diamond-backed terrapins.

A vote to oppose any legislation establishing a dove season.

A vote to authorize the Director to close the Connecticut River to Atlantic salmon fishing for a 90-day period.

FISHERIES AND WILDLIFE BOARD MEMBERS

George Darey, Chairman

Nancy Begin

Colton H. Bridges

Ray Whitaker

Jack Creedon

Laurence Fountain

Gwilym Jones

Fisheries

Peter H. Oatis
Assistant Director of Fisheries

Acid Rain Investigations

The Acid Rain Monitoring Project conducted through the Massachusetts Water Resources Research Center at the University of Massachusetts successfully completed Phase II, the initial screening of the entire state for pH, alkalinity and heavy metal analysis. This effort, when combined with the first phase, utilizes over 2,700 sampling sites across the state and provides a strong basis for the design of Phase III which will entail monitoring of approximately 800 sites on a quarterly basis for the next ten years. The data gathered to date clearly indicate that a significant portion of our inland aquatic resources are threatened by continuing acidification. About seventeen percent of our water bodies are now classified as critical or acidified (alkalinity values less than 2ppm), forty percent are endangered (alkalinity values are below 10ppm), and have very little capacity to buffer additional acid load.

An aquatic research review committee was established for the purpose of soliciting and reviewing research proposals designed to investigate the impacts of acidification on aquatic resources. Requests for proposals went out through a variety of publications and 13 proposals were submitted and reviewed. Of these, three were accepted for funding. They include a study designed to explain the mechanism for mercury methylation which is greatly accelerated in acid waters and causes increased amounts of mercury in fish. Other studies include one to better define the pathways by which aluminum enters acid waters. Another offers funding for water chemistry analyses on the impact of acidification on salamander populations in vernal ponds.

The fisheries section completed and presented a paper entitled "A Preliminary Economic Assessment of Liming Lakes in Massachusetts" at the Northeast Fish and Wildlife Conference in Hershey, Pennsylvania. The section also funded and assisted the Massachusetts Audubon Society with the second year effort of assessing the impacts of liming Cape Cod kettle ponds. The project also funded and assisted Dr. Paul Kostecki of the University of Massachusetts in two projects, the first dealing with determining potential impact of acidification and heavy metal increases on the reproduction of rainbow smelt. The second was an investigation of the possibility of devising an indicator of stress in fish populations subjected to increasing levels of acidification.

A major effort aimed at evaluating mitigative techniques applicable to stream environments was initiated with the U. S. Fish and Wildlife Service. The Massachusetts Division of Fisheries and Wildlife applied for and received a National Acid Precipitation Program grant in excess of $500,000 that will enable us to determine the costs and advantages of dosing flowing waters with lime on a demand basis. After an extensive screening process, acid-impacted Whetstone Brook in the Wendell State Forest was selected as the study area. The study is designed to run over a five-year period with the first few years being used to accurately assess base-line information and the next three years for determining the effects of liming on the stream biota. Gauging stations have been installed by the U. S. Geological Survey, detailed maps of the study area have been prepared and the water chemistry analytical laboratory has passed all quality control and assurance standards. Extensive prelminary biological investigations were initiated and a project leader, Dr. Kenneth Simmons, was hired through the Cooperative Fisheries Unit at the University.

We also completed an Environmental Impact Report for a generic liming permit and signed an agreement with Living Lakes, Inc., a non-profit group, as a means of defraying the costs of liming several acidic lakes. Through this agreement, six acidic Cape Cod kettle ponds were limed. Follow-up investigations relative to the impact and assessment of benefits of the liming are being evaluated by the contractor at no cost to the Division or the Commonwealth. Some additional lakes will be treated with lime during fiscal year 1988.

The threat of increasing acidification of our inland waters is very real and will likely place increasing demand on fisheries staff resources. The mitigative strategies being developed are an effort to maintain the existing fisheries and represent a stopgap measure that will hopefully buy time until actual causes of acidification can be addressed.

Fisheries Development

The bulk of the effort in this project was spent with Trout Unlimited volunteers working under the direction of staff biologists. Members of the Southeast Chapter of Trout Unlimited cut willows in the Quashnet River Sections Three and Four, removed sand barriers in Section Five and constructed a one hundred-foot spawning channel in Section Four. Pioneer Valley Chapter members completed Operation Restore commitments by filling, loam-topping and planting grass on the last stream deflector in the catch-and-release area of the Swift River.

Planning and land clearing for anticipated improvements at the Sunderland Trout Hatchery progressed on schedule as did the production of 3,700 Northern pike and 4,700 tiger muskie at the Reed State Fish Hatchery. The successful netting of 40 mature walleye from Assawompsett Pond in Lakeville gave some indication that the Division may soon have a supply of fish from which to develop fishable populations of walleye in a few selected waters of the Commonwealth.

Anadromous Fish Investigations

Connecticut River

Fish passage at the Holyoke Dam was very successful this year due to low water and early installation of the flashboards across the dam. A total of 481,668 shad, 632,225 blueback herring, 40,308 lamprey, 369 striped bass and 285 Atlantic salmon were passed through the facility. Approximately 6,298 shad were transported from Holyoke to other river basins throughout the Northeast.

Fish passage at Turners Falls was better than in previous years but there is still a major impediment to upstream migration between the Cabot Station and the spillway and gatehouse fishways. Shad passage at Cabot was 31,000 and the spillway fishway was 843; however, passage through the gatehouse, and hence access to up-river areas, was only 3,855 shad (12%). Observations at the log sluice spillway indicate that at least half of the shad passed at Cabot Station did return to the lower river. Shad angling data were not tabulated this year, but a new world record of 11 pounds, 4 ounces was set by Robert Thibodo of Northampton.

During the fall, 32,800 salmon parr reared at the Reed Hatchery were marked with coded wire tags. These fish were released into the Millers and Deerfield Rivers as smolts during the spring of 1986. Subsequent salmon rearing activity at Reed Hatchery will be focused on the production of adult salmon females for the purpose of increasing egg and fry supplies. These juveniles will be planted throughout the basin in coldwater streams for the purpose of increasing the number and quality of Connecticut River smolts. The salmon smolt production potential within the Massachusetts portion of the basin is currently being assessed through the efforts of the Massachusetts Cooperative Fisheries Research Unit. Initial investigations are in progress along the Bear and South Rivers within the Deerfield drainage.

Merrimack River

Although hampered by mechanical difficulties at Essex Dam, the 13,086 shad passed represent a 138% increase in passage. Doubtless the low water conditions and early installation of the flashboards contributed significantly to the increased efficiency of the shad lift operation. A total of 23,112 herring were also passed along with 18,403 lamprey, 110 striped bass and 212 Atlantic salmon. Based upon interviews with 169 anglers fishing below the Essex Dam, we estimate the fishery supported 2,239 angler trips (7516 hours) and a catch of 4,633 shad. Approximately 81% of the shad caught were released. A few salmon were known to be caught and released, but none were reported by the anglers that were interviewed.

The fishway at Pawtucket Dam in Lowell is nearing completion and should be ready for the 1987 spring run. Unfortunately, there has been vandalism on the recently completed spillway ladder.

Considerable efforts are also being expended to forestall problems to the salmon program that may occur if a license is issued to develop hydropower at Sewalls Falls, New Hampshire. Discussions with Public Service Company of New Hampshire were also initiated to develop a schedule for the construction of upstream fish passage facilities at their five facilities which pose barriers to upstream passage along the main stem of the river.

Fisheries Survey and Inventory

Observation of 21 tributaries to the Quabbin Reservoir for evidence of smelt reproduction indicated that egg deposition was light with the exception of a 400 foot section of Underhill Brook. Low water levels in the reservoir (down 8 feet) preclude access to spawning habitat in many of the streams. Although only trace amounts of young-of-the-year smelt appeared on the Nash Hill screens later during the summer, the condition of both lake trout and landlocked salmon did not reflect any significant loss of forage base. At Quabbin, the creel agent interviewed 6,836 boat anglers during the season. Overall, angling activity in terms of trips was down 12%, fishing pressure in terms of hours was down 20% and the total harvest was down 31% in numbers and 14% by weight when compared to the previous year. This drop is attributed to extremely poor spring weather and to the fact that the reservoir water level was down about eight feet. This was the third consecutive spring that the reservoir was stocked with salmon smolts. Early indications are that the salmon are growing very well and numerous sub-legal (15-17 inch) fish are being caught and released. Creel data reveal that a significant amount of angling pressure formerly directed at lake trout has been redirected to salmon. The changed increase in the minimum legal length of salmon to 18 inches will be monitored for the next few years to see if the new regulation has in fact improved the quality of salmon fishing in the reservoir. Smallmouth bass fishing declined in about the same proportion as the pressure; however, the average weight of the fish appearing in the harvest increased by 16%. Subsequent scale reading will reveal whether this increase in the size of fish is due to anglers being more selective or there was poorer survival in some of the year classes that are just entering the fishery.

District crews and staff biologists conducted biological surveys of 23 lakes and 64 streams during the year. Information is being tabulated and computer programs are being developed for the rapid assimilation and analysis of all lake and stream inventory data. When compiled, the data will greatly facilitate future fisheries planning and environmental impact assessment investigations. The results of 573 angler questionnaires from around the state are also being tabulated and analyzed. The social and economic information gleaned from this exercise will also be used in the development of future fisheries regulations and management practices.

Poor hatchery survival of sea-run brown trout young continue to hamper the program in reaching its goal of 6% adult return from a release of 25,000 smolts. Although summer sampling in the streams indicates that post stocking survival is at least 8% for sub-adults, poor returns of adults indicate that additional effort must be expended to determine what the limiting factors are to adult survival in the estuary.

Technical Assistance

An increasing amount of staff time is being allocated to the Toxics in Fish Program. This program is a cooperative effort between this Division, the Division of Water Pollution Control and the Department of Public Health. The purpose is to collect and analyze fish from areas suspected to be contaminated with toxic substances that may be assimilated by fish and thus, become a public health hazard. This year's efforts focused primarily on the Ten Mile and Sudbury Rivers. Realization of the problem in these rivers has prompted this Division to initiate broader investigations relative to determining the impacts of toxic substances upon the aquatic wildlife resources.

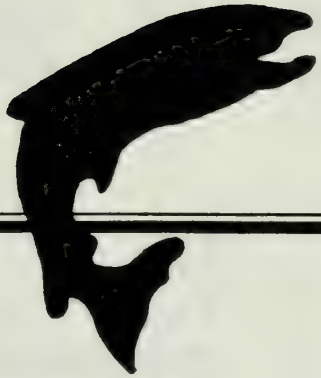
A wide variety of environmental impact reports were reviewed and commented upon as were numerous project permit applications. Much progress is being made with respect to computerizing the resource data presently on file at Field Headquarters. Because of their familiarity with data base programs, fisheries staff have also assisted staff members from other sections of the

Division in establishing files for license sales, equipment inventories and federal aid accounting processes.

Aquatic Resource Education

The Wallop-Breaux amendment to the Sportfishing Restoration Act now permits the expenditure of up to 10% of the federal matching money allocated to each state by the Act for the purpose of educating the public about aquatic issues. In April of 1986, the section completed the application for funds that will support an aquatic education program. Present plans call for the state supported Urban Angler Program and the aquatic segment of Project WILD to be funded by this Wallop-Breaux fund. This will place the programs on a more solid financial basis and allow production of numerous other aquatic educational materials. Because the program makes extensive use of volunteer services that can serve as the state's share of the program costs, the program will be funded essentially 100% by federal dollars. Future educational materials to be produced by the program include a book describing the distribution of freshwater fish throughout the Commonwealth and a series of four color posters depicting the freshwater fish of the state. These posters will be distributed to all middle schools in the state.

Fish Hatcheries



David Fredenburgh
Chief Fish Culturist

During fiscal year 1986, the Division's hatcheries produced 967,494 fish weighing 513,936 pounds. Of that number, 627,171 measured 9 inches or more. A detailed breakdown of production is included in the accompanying table.

Most of the operations were routine and involved normal fish production and maintenance at five fish hatcheries.

One unusual project was the beginning of a rejuvenation for the Sunderland Hatchery. A sum of thirty thousand dollars was allocated to construct an 18" x 24" gravel-packed well for the hatchery designed to produce 500 gallons per minute. It is hoped that the cost of construction will be met through a bond issue rather than trying to fund the project out of the existing development account.

The McLaughlin Hatchery continued with the yearly maintenance program of turbine pump replacement. This has allowed the hatchery to operate with minimal pumping problems.

A new six-inch well was installed at East Sandwich primarily to supply water to the hatchhouse in the event of a failure in the main well. The new well is designed to produce 100 gallons per minute.

At both Montague and Sunderland Hatcheries, wire grids were installed over selected sections of ponds and raceways to discourage birds, particularly great blue herons, from taking fish. These net grids are presently being evaluated for effectiveness. In general, it was a good production year with the sizes and quality of fish being above normal.

PRODUCTION FIGURES 1985 - 86

	5½"	6-9"	9+"	12+"	Tot. Fish	Weight
McLaughlin						
Rainbow	-	-	35,000	166,905	201,905	200,225
Brook	—	46,475	98,423	—	144,898	55,103
Brown	—	136,671	—	—	136,671	25,887
Quabbin Rainbow	65,235	—			65,235	3,051
Total	65,235	183,146	133,423	166,905	548,709	284,266
Palmer						
Rainbow	—	—	2,528	—	2,528	1,586
Northern Pike	—	—	3,400	—	3,400	690
Tiger Muskie	—	9,878	—	—	9,878	746
Land. Salmon			32,500		32,500	6,842
Total	—	9,878	38,428	—	48,306	9,864
Montague						
Rainbow	—	—	45,400	37,850	83,250	—
Brown			—	12,290	12,290	
Total	—	—	45,400	50,140	95,540	76,936
Sunderland						
Rainbow	—	—	56,659	—	56,659	44,641
Brook	—	—	15,110	—	15,110	14,790
Brown		5,000	21,001		26,001	21,286
Total	—	5,000	92,770	—	97,770	80,717
Sandwich						
Rainbow	—	—	39,100	—	39,100	23,176
Brook	—	13,800	36,375	—	50,175	18,263
Brown	—	36,789	24,630	—	61,419	19,433
Cohos	—	24,942	—	—	24,942	1,217
Cohos Sea-run		1,533			1,533	64
Total	—	77,064	100,105	—	177,169	62,153
Grand Totals	65,235	275,088	410,126	217,045	967,494	513,936

PLANNING

After many years of effort, the Division's long range plan was completed and published in January of 1985. Federal funding for the planning process was curtailed in April 30, 1985. These factors, coupled with the resignation on July 1, 1985 of Kristine Corey who had headed the Division's planning office, combined to halt formal planning activities for the time being. During this fiscal year there was no activity in the planning program.

Wildlife

Wayne F. MacCallum
Assistant Director of Wildlife

The Wildlife Research Section is responsible for the management of the approximately 75 species of birds, mammals, reptiles and amphibians which are traditionally hunted or trapped. Principal activities of the section include monitoring of population levels and annual harvest, development of recommendations concerning regulations and policy relative to the Commonwealth's wildlife resources, planning and implementation of habitat management programs, development of Division-funded University of Massachusetts Cooperative Wildlife Research Unit studies, technical assistance to other agencies and private citizens experiencing problems caused by wildlife, development and implementation of wildlife research programs qualifying for federal grants. Summaries of current programs follow.

WATERFOWL

Pre-Season Banding

A total of 1,363 marsh birds were banded during the 1985 pre-season period; 559 wood ducks, 444 mallards, 118 black ducks, 18 mallard black duck hybrids, 78 blue-winged teal, 124 green-winged teal, 5 common moorhens, 12 soras and 1 Virginia rail. The majority (1,294) of birds were captured by airboat nightlighting. Other ducks were banded by bait trapping or nest box trapping.

Mid-Winter Waterfowl Survey

A total of 111,540 waterfowl were counted on the 1986 mid-winter survey, down 55% from last year, due primarily to a drop in the number of eider ducks observed. Black duck numbers, 21,820, were near average while numbers of mallards, canvasbacks and Canada geese were up substantially.

Winter Banding

The winter of 1985-86 was generally mild and afforded poor banding conditions. This was the third such winter in the past four years. Only 177 black ducks were banded along with 59 hybrids, 22 mallards, and 8 pintails. Hybrids comprised 23% of the mallards and black ducks banded with the highest rate again in the Plymouth-Duxbury area where the hybrid rate was 36%.

Canada Goose Study

No insert included.

Wood Duck Nest Structure Study

Five wood ducks used plastic buckets on 15 new study areas while six wood ducks and two hooded mergansers nested in wooden boxes. Box usage on 15 established wood duck production areas was 41% for 46 buckets and 59% for 169 boxes. The nesting success rate was 63% in buckets and 91% in boxes.

Wood Duck Production Study

There were 216 wood duck and 12 hooded merganser nest starts in 548 available structures on 50 wood duck production areas across the state. There were 189 successful wood duck hatches and 10 merganser hatches. The increased population appears to be a reflection of reduced harvests associated with season opening dates of October 20 or later.

Experimental Waterfowl Season Appraisal

After two years of zoning with the state divided into three zones, the waterfowl harvests was 2.6% below the average harvest experienced when the state was divided into only two zones and 29% below the pre-zoning average. Major declines were recorded in harvest of black ducks and wood ducks due, in large part, to harvest restrictions aimed at protection of black ducks.

Massachusetts achieved a 27% black duck harvest reduction in 1983 followed by a 30.4% reduction in 1984. A complete analysis of 1985 waterfowl harvest returns is not available at this time, but it appears that Massachusetts will easily exceed the federal requirement of a 25% reduction in black duck harvest over the three-year period.

Woodcock

The bag limit on woodcock was increased from two in 1984 to three birds in 1985 due to an increasing breeding bird index and an anticipated good breeding season due to favorable weather conditions.

Hunter success in 1985 increased with 1.8 birds bagged per day as compared to 1.4 in 1984. The seasonal bag also increased from 6.6 in 1984 to 9.1 in 1985.

Production (brood survival) in 1985 remained good with 2.7 immatures reported for each adult hen.

The 1986 spring singing-ground census showed an increase of 29%, up from 1.50 to 1.94 birds counted per survey route. Singing-ground counts are still below the long-term average, but have continued to improve since 1982 when a spring snowstorm severely affected the breeding woodcock population.

Mourning Dove Census

Due to manpower limitations and the limited usefulness of dove survey information, the number of dove survey routes in Massachusetts was decreased from 18 in 1985 to eight in 1986. The number of calling doves on three long-term routes increased 67% from 1985 to 1986. Counts on eight comparable routes increased 9% (101 to 110 doves) from 1985 to 1986.

Bobwhite Quail Census

The 1985 weighted call index for Plymouth County showed a significant increase over the 1983 index. The 1985 weighted index for Bristol County showed a significant decrease over a five-year (1975-83) mean index. Indices for all other counties and the statewide total showed no significant change when comparing 1985 indices to 1983, to the five-year mean (all routes) and to the five-year mean (comparable routes only).

White-Tailed Deer

Following a review of 1985 activities, an informal long range planning effort was initiated. This effort identified the following goals:

(1) Develop a conceptual management model that incorporates habitat, humans and deer.

(2) Establish data bases that document habitat, humans, and deer trend data for the state.

(3) Develop a deer population model that reconstructs deer population dynamics for the past 15 years.

(4) Develop carrying capacity guidelines for each deer management zone that include both human and habitat factors.

(5) Identify research needs to supplement model development.

Substantial progress was made toward each goal in 1986. The management model uses a systems approach that recognizes three components (habitat, humans, and deer), the interrelationships among these components, and the dynamics associated with the components. Data bases were established for each component. Future work will include automating these data bases in order to improve analysis efforts. A working deer population model was developed using a computer spreadsheet. This model appears adequate to describe population dynamics associated with past population trends. The model is still in a development stage but is operational at present. Carrying capacity estimates have been established and are being analyzed. Changes in these estimates may follow future research efforts. Research was initiated to improve understanding of fawn mortality, winter weather severity, deer herd condition, and population dynamics.

During the regular 1986 deer seasons, 5,610 deer were harvested by hunters. This is the highest harvest on record. Archers harvested about 10% of the deer during a three-week season. Shotgun hunters took 81% of the deer during a nine-day season in December. Approximately 9% of the harvest occurred in the three-day primitive firearm season. The female harvest rate is such that it will allow continued growth in herd productivity and in the deer population. Antlerless permits were allocated based on relative herd size and carrying capacity determinations for each management zone. Although management goals will allow overall growth in the state's herd, steps were taken to reduce or stabilize growth in those zones where human population density is high and/or deer hunters approach carrying capacity.

Future management efforts will be directed towards meeting established goals and continuing on-going research. Goals and progress will be reviewed each year in order to refine research efforts.

Furbearer

A total of 23 fur buyers submitted annual reports; six did not buy any furs from Massachusetts trappers or hunters. The remaining 17 purchased 22,476 muskrat, 556 mink, 52 otter, 5,339 raccoon, 764 red fox, 8 skunk, 103 gray fox, 509 beaver, 79 opossum, 10 bobcat, 84 fisher and 12 coyote.

The results of four fur auctions held by the Bay State Trappers Association were weighted and tabulated to give a yearly average. The average prices for 1985-86 were muskrat $3.21, mink $17.45, otter $25.60, raccoon $12.81, red fox $22.68, gray fox $22.84, beaver $23.15, opossum $1.05, bobcat $37.80, fisher $102.32 and coyote $21.60.

Falconry

During 1986, there were 34 licensed falconers in Massachusetts--10 apprentice, 16 general and 8 masters. Six breeding permits were issued and 27 raptor salvage permits. Raptor rehabilitators treated 343 birds of which 141 were released back to the wild.

Wildlife/Forestry Program

The first of three objectives for the wildlife/forestry program is to build an inventory data base for each wildlife management area (WMA) held by the Division of Fisheries and Wildlife. To date, this has been achieved on three areas and part of a fourth, totalling 4,000 acres (the 420-acre Savoy WMA, the 2,000-acre Hy Fox WMA, the 1,200-Fox Den WMA, and 400 acres of the 2,800-acre Peru WMA). The second objective of the program is to use the inventory data to design and carry out commercial forest cutting operations that improve wildlife habitat by providing a variety of forest age classes (0-10, 10-25, and 25+ year classes) interspersed with herbaceous openings.

The first such commercial operation has been initiated on the Hy Fox WMA in the towns of Chester and Worthington. A contract for the commercial sale of 350,000 board feet of timber and 700 cords of firewood was awarded to Gagnon Brothers Logging Company of Goshen, Massachusetts after a competitive bid procedure which attracted bids from six logging companies. The contract requires the establishment of herbaceous openings of 2-5 acres, in what was formerly extensive mature forest, relatively heavy cutting in mature hardwood stands of poor commercial value (to regenerate early successional stage forest and improve long-term commercial value), and selective cutting in mature pine and mix hardwood forest (to enhance growth of co-dominant trees and to provide regeneration of desirable species such as red oak). Revenue from the sale are being used for the construction of access roads, installation of locking gates (to reduce R.V. damage to roads), and preparation of herbaceous openings.

The third objective of the wildlife/forestry program is to determine the response of wildlife populations to management. Breeding song birds were chosen for census because they can be sampled accurately and relatively easily by sound, and the variety of bird species occurring on an area over time reflects changes in habitat quality. A breeding bird census was conducted on 1,000 acres of the Hy Fox WMA prior to cutting from May 31 to June 10, 1986 (85 species found), and the census will be repeated annually in cut and uncut areas each spring for the next three to five years.

The forestry program continues to benefit from interaction with the Massachusetts Cooperative Wildlife Research Unit and the University of Massachusetts Department of Forestry and Wildlife by hiring senior level and graduate students for inventory work (through the efforts of Wendell Dodge of the Cooperative Unit), and by using a computerized inventory data program (courtesy of Jow Mawson of the Department of Forestry and Wildlife).

Work planned for the immediate future includes forest inventory on the Peru, Becket, and Chalet WMAs, a second commercial sale on the Hy Fox WMA, and a commercial sale on the Fox Den WMA.

Wild Turkey Range and Harvest Evaluation

The seventh Massachusetts spring gobbler hunt was held in May 1986, with the three-week season (as in 1985) consisting of a one-week first segment (May 5-10) and a two-week second segment (May 12-24). The open hunting zone was expanded and included the following areas: Berkshire and Franklin counties, those portions of Hampden and Hampshire counties west of the west bank of the Connecticut River, and that portion of Worcester County west of state Route 31 and north of state Route 9. Hunters were allowed to apply for and hunt during only one segment of the season, but could hunt anywhere in the open zone. A total of 6,750 permits were allocated for each segment of which 3,873 were issued for the first period and 3,045 for the second period. A record number of turkeys--444--were taken; 329 the first period and 115 in the second period. Hunters had an overall participation rate of 89.1% and an overall success rate of 7.2%. The Berkshire County kill was 282 (63.5%) with Franklin (66) second and Worcester (36) third. Adult males comprised 270 (61%) of the take.

Although winter trapping was again hindered by the lack of snow, Division staff and Massachusetts Cooperative Wildlife Research Unit personnel succeeded in capturing 25 turkeys for translocation. Nineteen birds (8 adult female, 5 immature female and 6 immature male) were released on Rocky Gutter WMA, Middleboro, and five (immature male) were released on Bolton Flats WMA, Bolton. One immature male was injured and was not released.

Statewide Beaver Harvest

The 1985-86 beaver trapping season ran from November 15 to February 28 statewide as in 1984-85. Conibear traps larger than size No. 110 or the equivalent were not allowed after January 15. During this season, a total of 1,044 beaver were taken by 90 trappers in 105 towns, with a mean take of 11.6 beaver per successful trapper. This take represents a decrease of eight beaver (0.8%) from 1984-85. Harvests increased by more than 20% in Berkshire, Franklin, and Middlesex counties and in the western region. Decreases of more than 20% occurred in Hampshire and Worcester counties and in the eastern region. For the third consecutive year, harvests in the eastern region exceeded those in the western region.

Statewide Otter and Fisher Investigations

During the 1985 otter season, 55 successful trappers took 98 otter in 60 towns in eight counties for a mean take of 1.8 otter per successful trapper. This compares with a harvest of 142 and a mean take of 2.1 in 1984.

The fisher take increased from 140 in 1984 to 152 (the second highest take recorded) in 1985, with 55 successful trappers taking an average of 2.8 fisher each among 47 towns in eight counties. In 1984, 58 successful trappers took an average of 2.4 fisher each.

Worcester (35), Essex (14), Berkshire (13), and Franklin (12) counties and Zones 03 (29), and 02 (22) yielded the most otter, while Worcester (99), Franklin (27), and Middlesex (13) produced the most fisher.

A total of 98 otter carcasses and 151 fisher carcasses were received from cooperating trappers. The mean age of otter in 1985 was 2.21 and of fisher 1.39. This compares with 2.17 for otter and 1.55 for fisher in 1984. Eleven of 14 otter aged 2.5 and older and 14 of 18 fisher aged 1.5 and older showed evidence of reproductive activity. Average corpora lutea counts were 2.4 for otter and 2.9 for fisher in 1985, as compared to 2.5 and 3.0 respectively in 1984.

Bobcat Harvest Evaluation

A total of 23 bobcats were taken in 1985-86, including 16 by hunting, six by trapping, and one depredation kill. The mean take per successful hunter (N=14) was 1.1 (range: 1-2) and per successful trapper (N=2) was 3.0 (range: 1-5). All trapped bobcats were taken in November, while February (7, 44%) was the most successful month for hunting. During the 1985-86 season, bobcats were taken in 15 towns in six counties. Juveniles (0.5 age class) comprised 45% (9) of the sample (20).

Coyote Investigations and Harvest Study

A total of 31 coyotes were taken by 25 sportsmen in 23 towns and six counties during the 1985-86 hunting season. The majority (13, 42%) were taken in November with the same number and percentage targeting specifically for coyote. Six other mortalities, including four road kills, one illegal kill, and one accidentally-trapped animal were recorded during the 1985-86 report period.

Black Bear Reproductive Success and Cub Survival in Massachusetts

Six adult females that were potential cub producers were followed intensively on foot from early September through denning, as in previous years, to construct a profile of major fall food sources for each female.

Dens of these six females were visited during the first week of February 1986 and cubs were counted, sexed, tagged, and weighed. Only three cubs were born in two litters to six females, due primarily to the shortage of mast crops in some areas during the fall of 1985. In late March, one cub was collared and was subsequently followed intensively through May, when it slipped its collar.

Data analyses are complete and the final report is being prepared.

Black Bear Distribution and Harvest Investigations

A total of 921 bear hunting permits were issued for the 1985 hunting season. A total of 14 bear were taken during the two-week split season, including 13 during the first segment and one during the second segment. Five males and nine females were taken in Berkshire (5), Franklin (4), Hampshire (3), and Hampden (2) counties. Two non-hunting mortalities, both road kills, were recorded. Only one nuisance bear report was received.

Cooperative Unit Studies

Harvest Surveys and Analyses

A random sample of 1984 hunting license purchasers from each Massachusetts county was surveyed by mail questionnaires in March. Of 1,247 sampled individuals, 439 (35.20%) returned questionnaires. An additional 355 non-respondents were contacted and interviewed by telephone in April resulting in 794 (63.67%) total contacts. Statewide game harvest estimates were tabulated for various small game species.

An estimated 74,764 (SE= 2,082) individuals hunted in Massachusetts during the 1985-86 hunting season. Total hunting license sales and percentages of individuals who purchased licenses in 1984 and hunted in Massachusetts during the 1985-86 season were tabulated.

White-tailed deer was the most sought game animal with approximately 62,150 (SE= 2,067) hunters seeking them. Pheasant was the most sought small game species with an estimated 42,487 (SE= 1,995) hunters seeking. Remaining game and furbearer species and estimated harvests will be compared with results from a second survey to be conducted in 1987.

Mortality of White-tailed Deer Fawns in Western Massachusetts

Ordering of equipment and materials delayed field work and hence the capture of adult does. Fifteen bait sites were established in southern Berkshire County in mid-February. Deer usage of bait sites was very good. However, due to lack of suitable snow cover and an early spring, deer usage of bait sites became very sporadic in March, making immobilization attempts unsuccessful.

Clover traps were installed in late March. Because of absence of snow cover, deer had alternate foods and would not enter traps for bait. Trapping and immobilization were discontinued on May 4.

One doe was immobilized and collared in March and monitored through parturition. Despite intensive ground searches her two fawns could not be located until they were 8-10 days old, and would avoid searchers. These two fawns are currently being monitored through activities of the dam.

During April and the first two weeks of May, spotlight census and surveys of areas were conducted to identify probable fawning sites. Ground searches were conducted from May 20 through June 12. Six fawns were captured and fitted with radio collars. These fawns will be monitored through fall 1986.

Summer trapping of adult females will be attempted in late June-July using salt as bait in clover traps. Winter baiting and trapping will begin in mid-December.

Wild Turkey Population Dynamics

Birds instrumented during the last reporting period were monitored through December 1985. Hens with broods were intensively monitored to determine poult survival and brood habitat use. Vegetation at brood locations was measured in order to characterize preferred habitat. Trapping operations were conducted January - February to recapture instrumented or banded birds. A final report is in preparation.

Statewide Development (W-9-D)

The following jobs were performed on wildlife management areas throughout the state during Fiscal 1986:

Building Maintenance	15 buildings
Dam Maintenance	5 dams
Bridge Maintenance	6 bridges
Road and Trail Maintenance	103 miles
Parking Lot Constructed	1 lot
Parking Lots Maintained	86 lots
Maintenance of Blinds	15 blinds
Posting Boundaries	132.1 miles
Posting Signs	2296 signs
Planting Trees and Shrubs	2100 plants
Maintenance of Fields	342 acres
Administering Cooperative Farm Agreements	808 acres
Clearing	one acre
Brushcutting and Herbiciding	300 acres
Timber Management (selective cutting)	13 acres
Wood Duck Nest Box Construction - Maintenance	1155 boxes
Water Level Management	163 acres
Permit Hunting	4 areas
Gate Construction and Maintenance	63 gates

Additional time was spent in project planning, managing public hunts, inspecting areas and in repairing and maintaining project equipment.

Game Farms

Routine maintenance of buildings, grounds and rearing pens were conducted at both Sandwich and Ayer Game Farms. A total of four new bulk feed bins were installed at both farms. Ten large rearing pens were constructed at Ayer Game Farm increasing its rearing capacity to 30,000. The Sandwich Game Farm constructed a new water well.

Both farms continue a strict sanitary program in order to maintain disease free premises. In addition, the Sandwich Game Farm inoculated all brood stock against fowl cholera.

The following game birds were released as part of general distribution:

	Pheasant	Quail
Ayer	34,679	
Sandwich	13,460	4,470
Total	48,139*	4,470**

* Includes 4,416 birds under the Sportsmen's Rearing Program
** Includes 270 field trial birds

Nongame and Endangered Species

Bradford G. Blodget
State Ornithologist

In the Nongame and Endangered Species Program's second year of funding through a voluntary state income tax check-off, the earnings were $261,475, representing a 20% decline over the previous year.

On January 28, 1986, the Division and the U. S. Fish and Wildlife Service consummated a Limited Authority Plant Agreement for endangered and threatened plants found in Massachusetts. This agreement significantly expands and broadens the Division's responsibilities in this important area and augments our present agreement that dates from 1979 covering endangered and threatened wildlife.

Fiscal Year 1986 was a year of significant progress in the Nongame and Endangered Species Program and the affiliated Natural Heritage Program. Highlights of the year are as follows.

Peregrine Falcon Restoration

Six young peregrine falcons were received from the Peregrine Fund of Ithaca, New York for release from the John McCormack Post Office and Federal Court House Building in downtown Boston. These young falcons were placed in a "hack box" located on the building's roof on June 7, 1985 and were released on June 16 . Immediately after release, a sub-adult eregrine appeared at the site and began harassing the young birds as they made their first flights.

This harassment lasted eight days and resulted indirectly in the loss of two young falcons. One bird was chased until it was killed by striking a building and a second bird was chased so far from the release site that it was apparently not able to find its way back. After the harassment ceased the older falcon became a positive influence on the younger birds which performed behaviors, such as hunting, at least two weeks sooner than the falcons that were released in 1984.

On June 29 , the sub-adult falcon came to the hack box to feed and was identified as "Dublin" (yellow band #141), a male falcon released at the site in 1984. He returned to the hack box at least nine times, feeding four times on food left out for the younger falcons.

On July 23 , one of the young falcons was picked up at Logan Airport in a weak condition. The wildlife clinic at the Tufts School of Veterinary Medicine diagnosed the problem as trichomoniasis, caused by a common bird parasite. After treatment, this bird regained its strength and was re-released on August 22 . On July 30 , another of the young falcons was killed after flying into a large glass window at the Prudential Building.

Bald Eagle Restoration

The number of young eagles released at Quabbin Reservoir was increased to eight this year. After being collected from wild nests on Cape Breton, Nova Scotia, the eight young eagles were flown to Massachusetts on June 21, 1985. All eight were released in good health on August 9 . The eagles were monitored through the fall with five of the birds known to be at the reservoir through mid-December. Winter observations revealed two of the young eagles wintering at Quabbin.

On August 9, 1985, a 1984-released eagle that had been found shot at Quabbin, was re-released along with the newly hacked birds. This eagle had been found injured in March 1985 and had undergone prolonged treatment at the Tufts University wildlife clinic.

On September 4, 1985, an eagle originally released at Quabbin in 1983 was found at the Toronto Reservoir, New York, suffering from mercury poisoning; it later died.

Eight new birds were received from Nova Scotia on June 20, 1986 for release in Fiscal year 1987.

Eagle Wintering Survey

The 1986 winter eagle survey was held on January 10, 1986. A total of 54 bald eagles (28 adults and 26 immature) were counted from seven localities around the state. Forty-two of these birds (23 adults and 19 immatures) were seen at Quabbin Reservoir. One golden eagle was also observed at Quabbin.

Plymouth Red-bellied Turtle

A contract to conduct research on the natural history and limiting factors of this endangered turtle was continued with Dr. Terry Graham of Worcester State College.

During the spring of 1985, searches of nesting beaches revealed 24 clutches containing 325 eggs. From these nests, 107 viable hatchlings were produced and 50 of these were kept for headstarting by the New England Aquarium, Berkshire Museum, and Terry Graham. The remaining 57 were released directly into the wild. Thirty-one of the 50 headstarted turtles survived and will be released in July 1986. The 19 mortalities were due primarily to nutritional and lighting deficiencies. A meeting of all the cooperators was held on July 18, 1986 to address these problems and resulted in the development of a headstarting protocol. This document will insure that in the future, each cooperator will provide the necessary husbandry for the headstarted hatchlings.

Piping Plover

The East Coast Piping plover population was listed by the U. S. Fish and Wildlife Service ("the Service") as "threatened" on January 10, 1986. In expectation of this event, the program began collecting field reports in 1984 to establish the plover's status in Massachusetts. With improved inventory coverage, in 1986, 139 breeding pairs were tallied from 51 sites. All but nine pairs occurred south of Boston and 70 pairs (50%) occurred at sites on Cape Cod. The number of pairs at sites varied from one to 13. Productivity varied greatly from site to site. Threats to the birds reported from the various sites included disturbance and direct mortality of eggs and young from recreational beach users, off-road vehicles, dogs, foxes and gulls.

Some piping plover nests are protected incidental to the protection of tern colonies. Among the most notable management actions in 1986 was the U. S. Fish and Wildlife Services' closure of approximately three miles of outer beach on Plum Island within the Parker River National Wildlife Refuge expressly for the protection of piping plovers and least terns. Copies of a piping plover informational brochure developed by the U. S. Fish and Wildlife Service and reprinted by the Division of Fisheries and Wildlife are now available for distribution.

Tern Inventory and Management

The annual tern census, coordinated by the State Ornithologist, Bradford G. Blodget, yielded 11,719 breeding pairs in the state. This included 7,643 pairs of common terns at 20 sites (up 1% from 1985), 2,306 pairs of least terns at 42 sites (down 1% from 1985), 1,746 pairs of roseate terns at four sites (up 8% from 1985), and 24 pairs of Arctic terns at four sites (compared to 16 pairs at four sites in the two previous years). The annual survey of tern colonies in Massachusetts is probably the most thorough and long standing such survey in the Northeast. It would not be possible without the combined efforts of several other conservation organizations and numerous individual cooperators.

Short-eared Owl

The first year of a three year study of the population ecology, habitat use, and management needs of the Short-eared Owl in Massachusetts was completed in Fiscal ear 1986. Twenty to 25 resident pairs were estimated for the state, including eight to 11 pairs on Nantucket, five to six pairs on Monomoy National Wildlife Refuge, four pairs on Tuckernuck Island, one pair on Martha's Vineyard, one to two pairs on Muskeget Island, and one pair at Pocket Marsh on Cape Cod. This study was undertaken by Denver Holt under the direction of Zoologist Scott Melvin.

Rare Grassland Birds

Camp Edwards/Otis Air National Guard Base provides critical habitat for three species of rare grassland birds in Massachusetts: the upland sandpiper (State Endangered), the Northern harrier (State Threatened), and the grasshopper sparrow (Species of Special Concern). A study directed by Program Zoologist Scott Melvin began in 1985 to develop a management plan for the conservation of these grassland birds. Fourteen pairs of upland sandpipers, one pair of Northern harriers, and at least 22 pairs of grasshopper sparrows were present during the breeding season at this site. Upland sandpipers presently nest at only seven locations in Massachusetts and Camp Edwards/ Otis Air National Guard Base supports the largest population.

Osprey

Encouragement and restoration efforts of the state's osprey population made great strides in Fiscal Year 1986, setting many new records. A total of 116 occupied nests were reported, up 13% from 103 reported a year earlier. One hundred four nests were active (produced eggs), versus 88 in Fiscal Year 1985, for an 18% gain. Seventy-nine nests fledged young, up 20% from 66 a year earlier. A total of 166 young fledged in Fiscal Year 1986, up 14% from the previous year's results. The spectacular success of this program is demonstrated by comparison of this year's results with those a decade earlier when 45 young fledged from 17 nests.

Steady growth in the total population has been achieved as a result of lowered levels of toxicants such as DDT in the environment, the placement of artificial nest poles in suitable habitat by the Division and cooperators, and favorable weather during the breeding season. The most active cooperators continue to be Felix Neck Wildlife Sanctuary at Martha's Vineyard and Mr. and Mrs. Gilbert Fernandez at the Westport River.

During Fiscal Year 1986, seven new nest poles were installed by the program, bringing to 31 the total number installed since the project's inception in 1981. Installations were made at Pamet River, Truro; Grand Cove, Dennis; Washburn Island, Falmouth; Flat Pond, Mashpee; Onset Bay and Widow's Cove, Wareham; and Great Island, Yarmouth.

Common Loon

In 1986, the Nongame and Endangered Species Program, Metropolitan District Commission, and the Massachusetts Audubon Society again received a joint grant from the North American Loon Fund. This grant helped fund a loon warden to monitor loons at Quabbin Reservoir. Five pairs of loons nested at Quabbin including, for the first time since the project's inception, one pair that nested on one of the six nesting rafts. Three chicks fledged, including one hatched aboard the raft.

Away from Quabbin Reservoir, a pair of loons nested at Wachusett Reservoir, raising two chicks.

Rare Plants and Natural Communities

Many new records of rare plants and unusual natural communities were added to the computerized data base. Some of the more important plants included the second state occurrence of oysterleaf (*Mertensia maritima*), St. Andrews cross (*Hypericum stragulum*), papillose nut-rush (*Scleria pauciflora* var. *caroliniana*), boreal wormwood (*Artemisia campestris*), and golden-seal (*Hydrastis canadensis*); the first current state occurrence of small burr-reed (*Sparganium minimum*); the third occurrence of two-flowered rush (*Juncus biflorus*); the largest state populations of pygmy weed (*Crassula aquatica*) and purple needlegrass (*Aristida purpurascens*); and the discovery in the state of lake quillwort (*Isoctes macrospora*), last seen in 1967, and water sedge (*Carex aquatilia*), last seen in 1930. Botanist Bruce Sorrie and Heritage Coordinator Henry Woolsey authored a paper entitled, "Distribution of Atlantic White Cedar in Massachusetts" which appeared in the proceedings of a symposium on this restricted species.

Environmental Review

A total of 1,151 projects were reviewed by the program of which 137 required written comments because of the presence of rare plants, rare animals, or exemplary natural communities.

Small Contracts

In an effort to stimulate more research on rare and endangered species, and natural communities, a Small Contracts Program was initiated. This program was designed to provide $100 to $2,000 for small, but high priority research topics. These contracts should be particularly helpful to student researchers. Of the thirty-six proposals received, 19 were selected for funding, totalling $11,265.

NONGAME ADVISORY COMMITTEE MEMBERS

Kathleen S. Anderson

Robert A. Clark

Marilyn J. Flor

Karsten E. Hartel

Gwilym S. Jones

Richard T. Kleber

Dr. James McCarthy

C. Barre Hellquist

Christopher Leahy

District Reports

Northeast District, Walter L. Hoyt, District Wildlife Manager
Southeast District, Louis Hambly, District Wildlife Manager
Central District, Chris Thurlow, District Wildlife Manager
Connecticut Valley District, Herman Covey, District Wildlife Manager
Western District, Tom Keefe, District Wildlife Manager

The five wildlife districts form the field presence of the Division of Fisheries and Wildlife administering wildlife lands and dealing with wildlife issues throughout the Commonwealth.

Staff from the districts conduct fisheries and wildlife research projects under the direction of research biologists, conduct stocking programs, operate check stations, and serve as liaison with sporting and conservation groups in their areas. During the year, all Districts distributed licenses, abstracts and other material related to hunting/fishing license sales and they assisted officers from the Division of Environmental Law Enforcement in ensuring public adherance to wildlife laws and regulations.

Personnel from all districts staffed deer checking stations, and checked furbearer pelts, while staff from the Western and Connecticut Valley Districts also operated bear and turkey checking stations.

During the past year, District staff participated in a variety of on-going research programs; the mid-winter eagle survey, banding black ducks, waterfowl inventory flights, inventory of mourning doves, woodcock, quail (Southeast), and bats (Western), survey of great blue heron rookeries and monitoring the pH levels of ponds and streams prior to fish stocking. Special projects brought staff from the Western Wildlife District out to assist researchers from the University of Massachusetts Cooperative Research Unit in the early stages of a study of fawn mortality and brought staff from the Connecticut Valley Wildlife District into the field to assist Project Leader Steve Henry with the Salmon Restoration Project. Central District staff conducted research on landlocked salmon at Wachusett Reservoir and on landlocked alewives at South Pond and at Singletary Lake. Members of the Southeast District continued a walleye pike program at Assawompsett Pond in Lakeville. Forty-four adult walleyes were captured and tagged. Fertilized eggs from the captured fish were hatched in a tank using Assawompsett Pond water. The successful hatching reassured biologists that the fish are capable of reproducing and that the water quality is adequate.

In addition to these duties, District staff members conducted statewide stocking programs releasing Eastern brook trout, brown trout, rainbow trout, Northern pike, and tiger muskies into ponds, lakes and rivers. Central District also released 13,000 landlocked salmon fry into tributaries of the Wachusett Reservoir. Districts also released pheasants, quail and snowshoe hare in appropriate upland areas and delivered pheasants to sportsmen's clubs participating in the club pheasant rearing program.

The majority of the time not spent in research or stocking activities was spent in maintaining and improving the Division's 40 wildlife management areas. Here District crews cut brush, seeded open areas, pruned and released fruit and nut trees. They also maintained roads, trails, and parking areas, posted signs, marked boundaries and repaired gates. Crews from the Southeast District cut brush and trees along the dikes of the Rochester rearing system to make the area more accessible to anglers. This District was hard hit by Hurricane Gloria and thus, had to apply special effort to clearing roadways of limbs and fallen trees and re-opening the streams of the Hockomock Wildlife Management Area. They also had to contend with vandalism at the fishing pier on Cook's Pond. While repairing the damage, they noted that the main beams of the pier are beginning to rot and need to be replaced. Staff of the Central District focussed special attention on the Birch Hill Wildlife Management Area where they installed access gates, brush cut fields and where the U. S. Army Corps of Engineers graded roads, and constructed a foot bridge.

Cooperative farming agreements were drawn up for wildlife management areas where appropriate.

Although District personnel had long been involved in the land acquisition program, this year saw a special effort in this area and found District staffers more involved than ever before in the process of identifying lands for possible purchase. The program was further expanded during this year by the addition to each District staff of one Realty Specialist responsible for conducting an aggressive program of land acquisition within the District.

As usual, the staff of all five districts were involved in many forms of technical review. They were called upon to review the Environmental Monitor for projects having an impact on wildlife. They provided data on wildlife and critical wildlife habitat and offered comments and guidance as needed. They investigated fish kill reports, advised callers on nuisance animal control and offered technical guidance to such groups as the U. S. Army Corps of Engineers, local selectmen, the U. S. Fish and Wildlife Service, legislators and private citizens. District crews were called upon to rescue a deer from a quarry, a loon from a wastewater treatment plant and they also investigated complaints about Canada geese, bear, beaver, deer, coyote and turkey.

Crews from the Western, Central, and Southeast Districts assisted in the turkey translocation program through which birds were captured in the western part of the state and moved to central and eastern areas. During February, six males and thirteen females were released in the Rocky Gutter Wildlife Management Area in Middleboro. Since that time, numerous turkey sightings have been reported including some sightings of hens with poults indicating that the translocation has been successful.

Central District crews assisted with renovation of the eagle hacking tower while staff of the Connecticut Valley District provided food for the eagles. Central District staff built and placed 20 bluebird boxes on wildlife management areas and erected a sign for the bluebird trail on the High Ridge Wildlife Management Area. A crew from the Connecticut Valley District assisted Sunderland Fish Hatchery personnel in constructing an exclosure system of poles strung with wire and nylon cord to keep out great blue herons which had been preying on the trout confined in the hatchery pools.

Charged with the oversight and maintenance of good public relations within their area, District managers attended meetings of the local county leagues of sportsmen's clubs, spoke with a wide variety of groups, and offered films and programs on Division programs as possible. In addition, the District manager, or his designee, attended public meetings, made press contacts, responded to public inquiries and staffed fairs and shows.

Information and Education

Ellie Horwitz
Chief
Information and Education

Media Contacts

The Division continued its program of active communications with the media and received increasing amounts of positive press coverage. As press release figures are maintained on a calendar year basis, 1985 figures have been used for purposes of this report. In all, 32 press packets were issued containing 151 press releases. These were enthusiastically received by the press which responded to Division programs and concerns by presenting an average of 374 features per month which dealt with Division activities.

Eight special events brought members of the press to watch young eagles arriving for rearing and being released to the wild, a red-tailed hawk foster-parenting two orphaned young hawks, Division personnel taking part in a research program on black bear, the inauguration of the state's first bluebird trail, and the release of wild turkeys in eastern Massachusetts.

This continued the marked upward trend in press coverage of wildlife issues which has been evident during the past nine years.

Exhibits and Programs

Hundreds of thousands of people became aware of the Division and its programs through visits to the Division's display at the Eastern States Exposition, the New England Fishing Exposition, the Springfield Sportsmen's Show, large local fairs such as the annual Greenfield and Topsfield Fairs, and many smaller exhibits aimed particularly at individuals interested in wildlife and conservation. As usual, Division staff prepared an extensive live animal display which was made even more attractive by the addition of a new mural painted by graphics assistant Cindy Slocum. At this time, the large display was renewed and replacement of several large components, including the pool, was initiated.

Many other people learned of Division programs through Division film presentations and slide programs offered at sportsman's clubs, civic clubs, garden clubs and other conservation-minded groups by Division staff members. Perhaps the most active in this area was Division photographer Jack Swedberg who reported 56 programs presented to a wide variety of groups.

Education

Perhaps the most significant step taken during this year was initiation of the Division's participation in Project WILD, an interdisciplinary wildlife program which offers activities for teachers of grades K-12. This program is design to stimulate an interest in and an awareness of wildlife which can, in turn, lead both teachers and students to develop a sense of responsibility for human actions which affect wildlife. In August of 1985, representatives of this section met with staff of the Massachusetts Audubon Society to form a cooperative partnership that will bring the program to Massachusetts. Shortly thereafter, two workshops were held to train an initial group of 20 teachers and 13 facilitators who will, in turn, train teachers. At first the program was controversial with certain animal rights groups protesting loudly and writing to school superintendents to ask them to block the use of this program. Despite this, the program held three more workshops and issued two copies of a WILD newsletter.

The Massachusetts Junior Conservation Camp, in operation since 1952, held another very successful session teaching the basics of fisheries and wildlife management and the rudiments of outdoor sports to a full contingent of campers during the designated two-week session. As usual, the camp, which was administered by the Division, featured sessions on fisheries and wildlife management taught by section staff members.

Nongame Fund Promotion

This year there was a shift in management of the Nongame promotional effort. Initially, Nongame Information Specialist Joy Merzer prepared special film footage for use in television spots and prepared a wetlands exhibit for the Boston Flower Show. In mid-year, Merzer left the program and was replaced by Marketing Specialist Dwight Galler. Galler came to the agency with a strong marketing background and initiated some tight promotional planning. Although some first attempts to obtain information on donors from the Department of Revenue and to include fund brochures with revenue mailings failed, other new initiatives such as developing a donor profile and inauguration of a miniseries on endangered species on WNEV-TV, were notably successful. Dwight arranged to have the Nongame Fund message carried on milk cartons and on three billboards. Eagle Snacks promoted the Fund at four events at the Worcester Centrum.

Tags 'n' Trout

Tags 'n' Trout continued to grow with 18 participating groups, and the Sportfishing Awards Program set a participation record with 780 pins issued to anglers who took notable fish in 20 categories, 174 of them American shad. As a result, the weight limit for shad was raised from 6 pounds to 7 pounds. Volunteer intern David Riegle prepared an analysis of returns from the program to date. New check stations were added and the program's logo was redesigned to give it a more modern look.

Visibility

In 1985 a modest effort was initiated to improve the Division's appearance both in-house and at exhibits and to increase staff familiarity with other programs within the Division so that they could serve as well-informed spokesmen. With this as a goal, name signs were provided for offices in Westboro, name badges were issued to most field staff, and blazers were provided to all personnel working on exhibits.

To increase staff familiarity with programs, the section again organized an employees conference which focussed on new programs and new achievements within the Division.

Publications

Only two publications were added to the list this year as texts were prepared for a flyer on bluebirds and another on bluegills.

The Waterfowl Stamp Program, which has drawn considerable public interest over the past 12 years underwent a thorough review this year. Recommendations for revisions in procedures were sent to the Director and a strong recommendation was made to increase the price of the stamps.

Information and Education Planning

Looking ahead, Section Chief Ellie Horwitz began to investigate a program of preparing and marketing a limited set of prints of paintings by

Louis Agassiz Fuertes. The original artwork for these prints appeared in 1927 in Birds of Massachusetts and Other New England States. Originals of these paintings had been located in the Massachusetts archives and restored with a grant from the Massachusetts Audubon Society. Very late in the year, the legislature passed a bill permitting the Massachusetts Division of Fisheries and Wildlife to prepare and sell an edition of prints with all proceeds to be divided between the Inland Fish and Wildlife Fund and the Nongame Fund.

Realty

Floyd Richardson
Chief of Wildlife Lands

A special allotment, earmarked for acquisition of open space, provided the "adrenaline" for an increased effort on behalf of the Realty Program this year. It stimulated acquisition of 1,156 acres of newly public land and permitted the staff to expand its horizons to the benefit of wildlife and the public.

Under this allotment, stipulated in Chapter 723 of the Acts of 1983 MGL, land acquisition was sanctioned in a number of categories.

This narrative identifies the acquisitions completed during Fiscal Year 1986, the type of property purchased in each instance, the purpose of said property, and the category of the capital outlay budget which made this particular acquisition possible.

Hinsdale Flats Wildlife Management Area 1,296.20 Acres

Seventy-six and one-half acres of woodlands, brushlands, abandoned pastureland and marshland made this acquisition an important addition to the existing wildlife management area. The land slopes gently from east to west providing ideal habitat for all species of wildlife indigenous to the region. The western boundary of this subject parcel is the East Branch of the Housatonic River. This latest purchase provides protection for the river from encroachment, beginning at the Washington/Hinsdale town line to Bullards Crossroads.

Fox Den Wildlife Management Area 846 Acres

A parcel of woodland adjacent to the existing area, this property, which looks over the Middle Branch of the Westfield River in the Town of Worthington, consists of 98 acres. Hardwood and softwood species blend to provide food and cover for wildlife while serving as erosion agents on this sloping site. The additional river frontage is a plus for this increasingly popular management area.

Peru Wildlife Management Area 3,365 Acres

The Peru Wildlife Management Area has been in existence for several years having come into this agency during the 1950s. The area has increased in size as opportunities to purchase presented themselves and acquisition funds were available. This area has provided sportsmen with diverse hunting opportunities and with fishing thrown in for good measure.

Two acquisitions this year improved the area by adding valuable road frontage which provides both additional access and off-road parking. These parcels contribute varied wildlife habitat and simultaneously prevent residential development from eroding a well-known wildlife area. These two acquisitions extend from Peru into Windsor and the combined acreage totals 363.5 additional acres.

Elbow Meadow Wildlife Management Area 13 Acres

The strategy formulated to provide protection for this great blue heron rookery was first initiated during the previous fiscal year, 1985. This Division continued its efforts to acquire, in fee, adjacent lands to permanently protect the rookery. An additional eight acres was acquired in June and the deed to the property recorded. Subsequently, the Dunstable Conservation Commission obtained an easement in perpetuity on seven adjacent acres further protecting this fragile environment.

High Ridge Wildlife Management Area 1,955.7 Acres

The acquisition of an additional 160 acres swells this management area to 1,955.7 acres. This newly acquired parcel adds a significant amount of forested land and creates an important connecting corridor to a state forest. Recent woodlot cutting practices have opened the overstory on this forested area allowing the sun to penetrate to the forest floor. This removal of the overstory encourages new sprout growth and plant life furnishing food for many species of wildlife.

Bolton Flats Wildlife Management Area 922.9 Acres

The transfer of 182 acres in the Town of Lancaster from the Division of Capital Planning and Operations to this agency was a most significant acquisition. This parcel previously separated existing Fish and Wildlife lands making control and management of the area difficult.

The transferred parcel extends from Route 110 to the Nashua River. It is level and extremely fertile. A small segment is utilized by the community through a community gardening program.

The Division of Fisheries and Wildlife is extremely grateful to the Division of Capital Planning and Operations for their consideration and efforts in the transfer of this highly valuable agricultural and wildlife property.

Housatonic River Valley Wildlife Management Area 816.9 Acres

A five-acre parcel adjacent to this wildlife management area in the Town of Lenox was conveyed to the Division by the General Electric Corporation in exchange for an easement. This acquisition serves a two-fold purpose providing additional wildlife lands adjacent to the Housatonic River, and adding to the river corridor that extends from Pittsfield to Lee.

Housatonic River Access Area 17 Acres

Two parcels in the Town of Great Barrington were purchased using Major River Capital Outlay Funds. These parcels contain 17 acres and contribute extensive road and river frontage, allowing easy access to the river for canoeing enthusiasts. The frontage provided along Brookside Road and East River Road by these parcels provide much needed off-road parking.

For canoeing enthusiasts, an exciting adventure awaits those who launch their canoes at this site and glide noiselessly downstream. The typically New England farmland scenery unfolds around each bend tempting the camera buff as will the sightings of the several species of wildlife which frequent this region. The encounters with wildlife one can expect include herons, song birds, turtles, mink, muskrat and deer.

Richmond Marshland — 23 Acres

The Town of Richmond, Berkshire County, hugs the New York state line. It is rural and extremely scenic, with rolling farmlands, apple orchards, forested hills and cool, clear brooks. This town also is noted for having the largest cattail marsh in Berkshire County. By accepting this gift, the Division and the public became the beneficiaries of 23 acres of this cattail marsh through the generosity of the Lon Nordeen Estate.

Phillipston Wildlife Management Area — 3515.5 Acres

This wildlife area lies in three towns--Phillipston, Petersham and Hubbardston--offering excellent hunting, cross-country skiing, hiking and other recreational opportunities.

The addition of 143 acres in Petersham is certainly a bonus, adding significantly to the area with its forested lands and one-half mile of frontage on the East Branch of the Swift River. The river frontage adds a new dimension by providing fishing opportunities.

Mashpee Pine Barrens — 65.1 Acres

The Mashpee site is the last remaining significant, unprotected pine barrens in Massachusetts. The Town of Mashpee has acquired adjoining lands providing a corridor which connects the newly-acquired wildlife lands with lands under the stewardship of the Wampanoag Tribal Council.

These pine barrens are a favorite nesting site for the whippoorwill; it is also home for the rare and endangered buck moth and the broom crowberry. This area is important as a water recharge area as the soils are predominantly sandy.

The Rare, Threatened, and Endangered Species Habitat Outlay Fund made this acquisition possible.

Podunk Marsh Acquisition Project — 15 Acres

This 15-acre parcel was donated to the Division by Richard Hildreth. The property is located in the Town of East Brookfield, west of Route 49. This particular marsh serves as a buffer to an existing great blue heron rookery.

Personnel Actions

Twenty-nine personnel changes were undertaken during this fiscal year. They are:

Appointments

Name	Job Title	Date
H. Wadach	Skilled Conservation Helper	01/21/86
P. MacAdams	Typist I - Part Time, Westboro	06/02/86
M. Plourde	Bookkeeper II, Boston	06/02/86
J. Santos	Typist II, Boston	06/08/86
R. Perham	Assistant Fish Culturist, Sandwich	06/15/86
A. Leach	Skilled Conservation Helper, McLaughlin	09/28/86
K. Carter	Typist I, Westboro	10/19/86
M. Hartleb	Typist I, Westboro	10/12/86
F. Ibili	Bookkeeper, I, Boston	12/28/86
B. Brockman	Skilled Conservation Helper, Southeast	11/16/86
R. Surette	Bookkeeper I, Boston	05/04/86

Retirements

Name	Job Title	Date
M. Oakley	Assistant Fish Culturist, Sandwich	02/02/86
W. Dauderis	Assistant Game Culturist, Ayer	07/11/86
E. LaBonte	Skilled Conservation Helper, McLaughlin	09/28/86

Deaths

H. Wiesner	Skilled Conservation Helper, Southeast	01/06/86
E. Lech	Conservation Helper, McLaughlin	04/16/86

Promotions

R. Norton	Skilled Conservation Helper, Southeast	03/30/86
S. Shea	Assistant Game Culturist, Boston	08/10/86
S. Henry	Senior Land Use Planner, Westboro	09/29/86
H. Kreiser	Skilled Conservation Helper, Northeast	12/30/86
G. Zima	Information Officer I, Westboro	09/27/86

Resignations

K. Miller	Senior Bookkeeper, Boston	04/15/86
M. LaFleur	Typist I, Westboro	07/11/86
E. Cocaine	Typist I, Westboro	07/11/86
M. Marenghi	Senior Bookkeeper, Boston	08/15/86
D. Bielecki	Skilled Conservation Helper, Conn. Valley	08/23/86
J. Hazzard	Skilled Conservation Helper, Central	12/31/86

Transfer

I. Howard	To D.E.M.	01/05/86
J. Sheppard	Public Access Board, Boston	

Legislation

Chapter		
131	Acts of 1986	Exempting veterinarians from civil liability as a result of rendering emergency care to non-domestic animals.
157	Acts of 1986	Relative to malicious killing or poisoning of animals.
159	Acts of 1986	Prohibiting the counterfeiting of tags and seals issued by the Division of Fisheries and Wildlife.
160	Acts of 1986	Regulating the transportation of certain reptiles and amphibians for commercial purposes.
175	Acts of 1986	Regulating the retail sale of ducklings.
262	Acts of 1986	Protecting wildlife under the Wetlands Protection Act.
337	Acts of 1986	Relative to the protection of Animals.
416	Acts of 1986	Prohibiting the exploitation of wild animals.
481	Acts of 1986	Establishing certain standards for the issuance of firearm licenses.
541	Acts of 1986	Requiring equal access to Commonwealth tidelands.
565	Acts of 1986	Transferring the Wetlands Restriction Program from the D.E.M. to D.E.Q.E.
570	Acts of 1986	Relative to contributions to the Nongame Wildlife Fund on State income tax returns.

APPROPRIATIONS AND EXPENDITURES
Fiscal Year July 1, 1985 to June 30, 1986

Inland Fish and Game Fund Accounts

Account No.		Appropriations	Expenditures & Liabilities	Total Reversions
2310-0200	Administration	804,390.00	785,733.00	18,657.00
2310-0315	Purchase of Equipment	277,785.00	263,771.55	14,013.45
2310-0400	Wildlife Management	3,339,580.00	3,105,929.60	233,650.40
		4,421,755.00	4,155,434.15	266,320.85

		Continuing Appropriations	Expenditures	Balance Forward
2310-0300	Dev. & Imp. of Facilities	131,026.95	73,741.14	57,285.81
2310-0310*	Acq. of Upland Areas	286,883.39	89,330.68	197,552.71
		417,910.34	163,071.82	254,838.52

		Capital Outlay Appropriation	Expenditures	Balance Forward
2670-9016	Coastal & Inland Acq.	3,940.99	-	3,940.99

General Fund Accounts

		Appropriations	Expenditures & Liabilities	Total Reversions
2310-0500	Nat. Heritage, Greenways	181,041.00	180,371.20	669.80
2310-0550	Acid Rain Program	332,016.00	330,345.54	1,670.46
		513,057.00	510,716.74	2,340.26

		Continuing Appropriations	Expenditures	Balance Forward
2310-0310*	Acq. of Upland Areas	95,627.79	29,776.89	65,850.90
2310-0551	Acid Rain Research	79,000.00	19,941.00	59,059.00
		174,627.79	49,717.89	124,909.90

		Capital Outlay Appropriations	Expenditures	Balance Forward
2310-8821	Wastewater Treatm. Facility	236,722.22	56,900.25	179,821.97
2310-8840	Acq. of Cold Water Streams	3,760,000.00	-	3,760,000.00
2310-8841	Associated Costs	240,000.00	-	240,000.00
2310-8842	Acq. of Adjacent Lands	7,050,000.00	-	7,050,000.00
2310-8843	Associated Costs	450,000.00	3,781.75	446,218.25
		11,736,722.22	60,682.00	11,676,040.22

Restricted Revenue Account

		Total Available	Expenditures	Balance Forward
2310-0312	"Mass Wildlife" Magazine	25,881.09	-	25,881.09

Nongame Wildlife Fund Account

		Appropriation	Expenditures & Liabilities	Total Reversions
2315-0100	Nongame Program	297,436.00	241,642.65	55,793.35

Trust Fund Account

		Total Available	Expenditures	Balance Forward
2310-6005	Bald Eagle Trust	19,445.99	13,185.18	6,260.81

---

*75% Inland Fish and Game Fund; 25% General Fund.

How the Sportsman's Dollar is Spent

Administration	Account No.	Expenditures		Perce age
Administration	2310-0200	$ 524,551.58		
Information-Education	2310-0200	261,181.42	$ 785,733.00	13.38
Wildlife Programs				
Game Farms	2310-0400	385,959.56		
Wildlife Management**	2310-0400	880,155.53		
Wildlife Cooperative Unit	2310-0400	72,000.00	1,338,115.09	22.7
Fisheries Programs				
Fish Hatcheries	2310-0400	944,687.91		
Fisheries Management**	2310-0400	751,126.60		
Fisheries Cooperative Unit	2310-0400	72,000.00	1,767,814.51	30.
Construction				
Development & Improvement of Facilities for Public Use*	2310-0300		73,741.14	1.2
Land Acquisition				
Acq. of Upland Areas & Inholding on Existing Areas* **	2310-0310		89,330.68	1.52
Equipment				
Purchase of Equipment	2310-0315		263,771.55	4.4
Dept. of Fisheries, Wildlife & Recreational Vehicles				
Natural Resource Officers' Salaries and Expenses(7.5%)	2350-0100		633,890.22	10.80
Hunter Safety Training***	2350-0101		197,928.32	3.38
Transfers from Fund				
Group Insurance	1590-1007		197,686.00	3.37
Salary Adjustments	2310-7001		3,618.00	.06
Retirement Assessment (.2%)	0612-1000		323,585.41	5.5
Interest on Bonded Debt	0699-2800		22,145.50	.38
Maturing Serial Bonds & Notes	0699-2900		174,000.00	2.9
TOTAL EXPENDITURES			$5,871,359.42	100.00

* Continuing Appropriation
** Portions of expenditures up to 75% reimbursable by Federal Government
*** 100% reimbursable by Federal Government

SUMMARY

SURPLUS, REVENUE, CREDITS, REVERSIONS
INLAND FISH AND GAME FUND
July 1, 1985 to June 30, 1986

	Receipt Acct. No.	Amount
Collected by Agency:		
Fishing, Hunting and Trapping Licenses*	3304-61-01-40	$3,868,400.46***
Archery Stamps*	3304-61-01-40	112,969.40
Trap Registrations*	3304-61-01-40	1,349.00
Waterfowl Stamps*	3304-40-01-40	6,960.65
Waterfowl Stamps-Ducks Unlimited*	3304-40-02-40	22,483.60
Special Licenses Tags & Posters**		24,322.75***
Antlerless Deer Permits	3304-61-14-40	41,010.00
Bear Permits	3304-61-14-40	4,600.00
Turkey Permits	3304-61-14-40	30,805.00
Rents	3304-63-01-40	21,790.50
Sales, Other	3304-64-99-40	11,541.95
Refunds Prior Year	3304-69-01-40	3,116.99
Miscellaneous Income	3304-69-99-40	16,558.54
		$4,165,908.84
Collected by State Treasurer:		
Fines and Penalties	3308-41-01-40	$ 55,286.99
Interest and Discount on Revenue	3395-60-01-40	56,000.45
		$111,287.44
Federal Aid Reimbursement:		
Pittman-Robertson	3304-67-01-40	$ 621,200.03
Dingell-Johnson	3304-67-02-40	192,978.42
Anadromous Fish Projects	3304-67-04-40	3,817.17
Endangered Species	3304-67-11-40	5,545.79
Indirect Cost Reimbursement	3304-67-67-40	242,878.62
		$1,066,420.03
Taxes:		
Gasoline Tax Apportionment	3312-05-01-40	$392,269.78
TOTAL REVENUE		$5,735,886.09
Transfers from General Fund:		
Salary Adjustments	3360-95-02-36	$ 3,618.00
Reimbursements on Half Price Licenses	3360-95-08-40	74,028.25
		$77,646.25
Reversions:		
Accounts Payable		$266,608.03
TOTAL CREDITS		$344,254.28

SURPLUS AS OF JUNE 30, 1986	$1,317,393.00

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* See Detail Sheet #1

** See Detail Sheet #2

*** As noted on Detail Sheets #1 and #2 $7,757.75 was inadvertently credited to receipt account 3304-61-10-40(Commercial Shooting Preserves); should have been credited to receipt account 3304-61-01-40(Licenses). Also, $2.50 credited to receipt account 3304-61-01-40(Licenses) should have been credited to receipt account 3304-64-01-40(Tags and Posters).

DIVISION OF FISHERIES AND WILDLIFE
RECEIPTS FROM FISHING, HUNTING AND TRAPPING LICENSES
Fiscal Year July 1, 1985 to June 30, 1986

Class & Type of License	Unit Price	Quantity	Gross Amount	Fees Retained by City/Town Clerks	Net Returned to Commonwealth
01 Res. Cit. Fishing	12.50	147,409	1,842,583.75	44,167.50	1,798,416.25
02 Res. Cit. Hunting	12.50	44,573	557,155.00	15,708.00	541,447.00
03 Res. Cit. Sporting	19.50	58,768	1,145,973.00	19,512.00	1,126,461.00
04 Res. Cit. Minor Fishing	6.50	8,246	53,599.00	2,784.50	50,814.50
05 Res. Alien Fishing	14.50	1,429	20,720.50	493.00	20,227.50
06 Non-Res. Cit./Alien Fishing	17.50	6,640	116,187.50	2,001.00	114,186.50
07 Non-Res. Cit./Alien Fishing (7 da.)	11.50	2,669	30,693.50	737.50	29,956.00
08 Non-Res. Cit./Alien Hunting (Small Game)	23.50	1,188	27,918.00	448.50	27,469.50
09 Non-Res. Cit./Alien C.S.P. (3 da.)	19.50	12	234.00	3.00	231.00
10 Res. Cit. Minor Trapping	8.50	84	714.00	34.00	680.00
11 Res. Cit. Trapping	20.50	709	14,534.50	291.00	14,243.50
12 Duplicates	2.00	3,506	7,012.00	-	7,012.00
13 Res. Alien Hunting	19.50	1,151	22,444.50	457.50	21,987.00
14 Non-Res. Cit./Alien Hunting (Big Game)	48.50	1,338	64,893.00	527.00	64,366.00
15 Res. Cit. Sporting (Over 70)	FREE	20,023			
16 Res. Cit. Fishing (Blind-Para.-Ment. Ret.)	FREE	1,415			
17 Res. Cit. Hunting (Paraplegic)	FREE	139			
18 Res. Cit. Fishing (Age 65-69)	6.25	6,157	38,480.75	2,656.50	35,824.25
19 Res. Cit. Hunting (Age 65-69)	6.25	656	4,100.00	298.50	3,801.50
20 Res. Cit. Sporting (Age 65-69)	9.75	2,771	27,017.25	1,203.50	25,813.75
21 Res. Cit. Trapping (Age 65-69)	10.25	43	440.75	18.50	422.25
24 Non-Res. Trapping	300.00	1	300.00	-	300.00
		308,927	3,975,001.00	91,341.50	3,883,659.50
Less Refunds/Bad Checks			(7,503.79)		(7,503.79)
		308,927	3,967,497.21	91,341.50	3,876,155.71
*Less Adjustments			(7,755.25)		(7,755.25)
		308,927	3,959,741.96	91,341.50	3,868,400.46
22 Archery/Primitive Firearms Stamps	5.10	22,481	114,653.10	1,683.70	112,969.40
Trap Registrations			1,349.00	-	1,349.00
		331,408	4,075,744.06	93,025.20	3,982,718.86
23 Waterfowl Stamps		23,158	28,947.50	4,585.50	24,362.00
		354,566	4,104,691.56	97,610.70	4,007,080.86

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Detail Sheet #2

SPECIAL LICENSES, TAGS AND POSTERS

July 1, 1985 to June 30, 1986

Receipt Account	Type of License	Quantity & Unit Price	Amount	Receipt Account Total
3304-61-02-40	Fur Buyers			
	Resident Citizens:	20 @ 25.00	500.00	
	Non-Residents or Aliens:	4 @ 75.00	300.00	$ 800.00
3304-61-03-40	Taxidermists	91 @ 20.00		1,820.00
3304-61-04-40	Propagators			
	Special Purpose Permits:	229 @ 1.00	229.00	
	Class 1 (Fish)			
	Initials:	11 @ 15.00	165.00	
	Renewals:	151 @ 10.00	1,510.00	
	Class 3 (Fish)			
	Initials:	13 @ 15.00	195.00	
	Renewals:	81 @ 10.00	810.00	
	Class 4 (Birds, Reptiles, Mammals)			
	Initials:	54 @ 15.00	810.00	
	Renewals:	405 @ 10.00	4,050.00	
	Class 6 (Dealers)			
	Initials:	16 @ 15.00	240.00	
	Renewals:	59 @ 10.00	590.00	
	Additional Stores:	160 @ 5.00	800.00	
	Class 7 (Individual Bird or Mammal)			
	Initials:	2 @ 5.00	10.00	
	Renewals:	26 @ 2.00	52.00	
	Importation Permits			
	Fish:	8 @ 7.50	60.00	
	Birds:	97 @ 7.50	727.50	
	Class 9 (Falconry)			
	Masters:	8 @ 25.00	200.00	
	Apprentices:	9 @ 25.00	225.00	
	General:	15 @ 25.00	375.00	
	Class 10 (Falconry)			
	Raptor Breeding:	5 @ 10.00	50.00	
	Class 11 (Falconry)			
	Raptor Salvage:	33 @ 1.00	33.00	11,131.50
3304-61-05-40	Take Shiners	88 @ 10.00		880.00
3304-61-06-40	Field Trial Licenses	32 @ 15.00		480.00
3304-61-07-40	Taking of Eels	3 @ 25.00	75.00	
	Taking of Carp and Sudkers	1 @ 10.00	10.00	85.00
3304-61-08-40	Quail for Training Dogs			
	Initials:	10 @ 7.50	75.00	
	Renewals:	25 @ 5.00	125.00	200.00
3304-61-10-40	Comm. Shooting Preserves	7 @ 50.00	350.00	
			*7,757.75	8,107.75
3304-61-12-40	Mounting Permits	3 @ 2.00		6.00
3304-61-13-40	Special Field Trial Permits	10 @ 15.00		150.00
3304-64-01-40	Tags and Posters:			
	Game Tags and Posters:	5,825 @ .10	*582.50	
	Fish Tags:	1,600 @ .05	80.00	662.50
				$24,322.75

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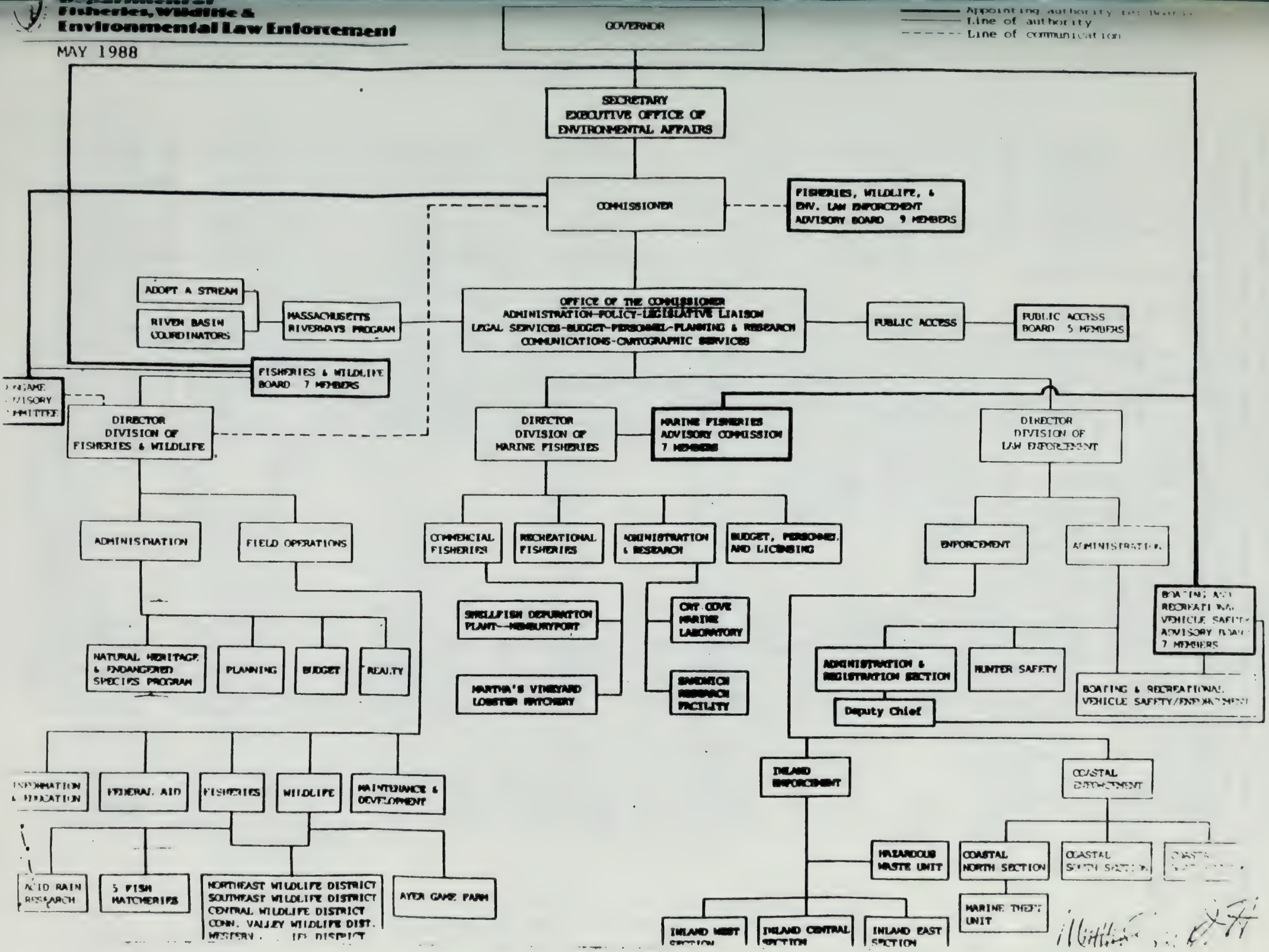
Fisheries, Wildlife & Environmental Law Enforcement

MAY 1988


Appointing authority to: Board
Line of authority
Line of communication
GOVERNOR
SECRETARY EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
COMMISSIONER
FISHERIES, WILDLIFE, & ENV. LAW ENFORCEMENT ADVISORY BOARD 9 MEMBERS
ADOPT A STREAM
RIVER BASIN COORDINATORS
MASSACHUSETTS RIVERWAYS PROGRAM
OFFICE OF THE COMMISSIONER
ADMINISTRATION-POLICY-LEGISLATIVE LIAISON
LEGAL SERVICES-BUDGET-PERSONNEL-PLANNING & RESEARCH
COMMUNICATIONS-CARTOGRAPHIC SERVICES
PUBLIC ACCESS
PUBLIC ACCESS BOARD 5 MEMBERS
FISHERIES & WILDLIFE BOARD 7 MEMBERS
GAME ADVISORY COMMITTEE
DIRECTOR DIVISION OF FISHERIES & WILDLIFE
DIRECTOR DIVISION OF MARINE FISHERIES
MARINE FISHERIES ADVISORY COMMISSION 7 MEMBERS
DIRECTOR DIVISION OF LAW ENFORCEMENT
ADMINISTRATION
FIELD OPERATIONS
COMMERCIAL FISHERIES
RECREATIONAL FISHERIES
ADMINISTRATION & RESEARCH
BUDGET, PERSONNEL AND LICENSING
ENFORCEMENT
ADMINISTRATION
BOATING AND RECREATIONAL VEHICLE SAFETY ADVISORY BOARD 7 MEMBERS
SHELLFISH DEPURATION PLANT—NEWBURYPORT
CAT COVE MARINE LABORATORY
MARTHA'S VINEYARD LOBSTER HATCHERY
SANDWICH RESEARCH FACILITY
ADMINISTRATION & REGISTRATION SECTION
HUNTER SAFETY
Deputy Chief
BOATING & RECREATIONAL VEHICLE SAFETY/ENFORCEMENT
NATURAL HERITAGE & ENDANGERED SPECIES PROGRAM
PLANNING
BUDGET
REALTY
INFORMATION & EDUCATION
FEDERAL AID
FISHERIES
WILDLIFE
MAINTENANCE & DEVELOPMENT
ACID RAIN RESEARCH
5 FISH HATCHERIES
NORTHEAST WILDLIFE DISTRICT
SOUTHEAST WILDLIFE DISTRICT
CENTRAL WILDLIFE DISTRICT
CONN. VALLEY WILDLIFE DIST.
WESTERN WILDLIFE DISTRICT
AYER GAME FARM
INLAND ENFORCEMENT
COASTAL ENFORCEMENT
HAZARDOUS WASTE UNIT
COASTAL NORTH SECTION
COASTAL SOUTH SECTION
COASTAL
MARINE THEFT UNIT
INLAND WEST SECTION
INLAND CENTRAL SECTION
INLAND EAST SECTION

Annual Report

1987

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Division of Fisheries & Wildlife

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THE BOARD REPORTS

George Darey
Chairman

1987 was marked by a new look for the Division of Fisheries and Wildlife. It was an exciting year. *Massachusetts Wildlife*, offered as a free publication for more than 35 years, expanded and became subscription based lifting a significant financial burden form the Inland Fish and Game Fund. In another streamlining move the basic license was redesigned in such a way that all permit applications were attached to the license itself eliminating the need for multiple printings and distribution. And as the licenses changed funds became available for an expanded form of Abstracts. The new forestry for wildlife program got underway with its first timber cutting contract on a wildlife management area. And Conservation Helper Gary Zima took over the leaderless Urban Angler Program with the mandate to develop it into an Aquatic Resources Education Program. The Division almost managed to issue a full color wildlife calendar. This project was abandoned however when it became apparent that funds for new projects would not be available.

Through it all, the Division and the Fisheries and Wildlife Board continued its day-to-day operations.

Board members met monthly throughout the year to discuss matters of policy, regulation or other special concern. Issues involving regulatory changes were brought up for one or more public hearings and more than six such hearings were scheduled during the year.

In the course of their monthly meetings the Board members addressed issues of Division operation including:

- problems involving the raising of rates on state owned properties. This affects the Division as certain buildings on Division property are occupied at reduced rents to ensure 24 hour coverage for certain properties. An increase in rental rates could cause a reduction in force willing to conduct round-the-clock maintenance or policing.
- review of employee status in view of the fact the two union contracts were approved. This has caused chenges in pay and title for numerous employees. As part of the Board's involvement in the issue of staff pay the Board took an active role in classification of the positions of Assistant Director of Fisheries and Assistant Director of Wildlife Research.
- review of the status of the Division's computer acquisition program.
- detailed review of the costs of the pheasant rearing program. The Division is doing all it can to hold down the costs of rearing these birds in light of the fact that costs are expected to rise 5-10%/year due to the increase in costs of grain and electricity.
- telephone problems. Various Board members have complained that it is virtually impossible to telephone the Field Headquarters. Following an extensive review, the telephone system was revised to include five (5) Boston Centrex numbers.
- exploration of possibilities for obtaining an Executive Secretary for the Board.

One of the key functions of the Board is to vote regulations. In this area the Board voted regulations as follows:

Limit the number of dogs which may be used in hunting bear. **Passed**

Permit the use of pistols larger than .357 caliber during the bear season. **Passed**

Require all who sell pelts of any of seven (7) species to have those pelts tagged by a Division of Fisheries & Wildlife staff member or other authorized checking agent. **Passed**

Expanded the turkey hunting zone. **Passed**

Through the regulatory process the Board members set regulations for the hunting of waterfowl. This year a special restriction mandates the use of steel shot in four counties. Over the next five years the requirement for waterfowl hunters to use non-toxic shot will be expanded until all waterfowl gunners use steel shot only!

The Board approved a recommendation for the numer and distribution of antlerless deer permits.

The Board voted to make permanent the restrictions prohibiting the taking of Atlantic Salmon. These regulations had previously been promulgated as emergency regulations.

A wide variety of diverse issues occupied Board members at the meetings. Among these are:

- Probably the most thoroughly discussed issue was that of the use of non-toxic (steel) shot. On four occasions Board members reviewed the "information available" file on types of shot to determine an appropriate implementation timeline.

- Hybrid Amur/Grass Carp — the issue of introducing this fish for weed control was discussed on three separate occasions and engendered more emotion than any other issue except lead vs. steel shot?. At the end of the year the Board had still opted to wait for more information on the fish.

- Catch and Release fishing regulations at Higgins Pond, Brewster. This regulation would extend the fishable time at Higgins and it would assist the fishery by allowing the Division to experiment with a special Canadian strain of brook trout.

- Passed an emergency regulation requiring that any deer taken on Cuttyhunk Island must be checked in on the island.

- Land Acquisition. T he Board reviewed a proposal by the Commissioner to expand the realty Section with the addition of five additional staff members. The Board voted that the concept of utilizing "03" money to secure the services of a land purchasing agent is excellent. They noted, however, that final authority for sales, must rest with the Division of Fisheries and Wildlife.

- Heard a proposal to raise the legal limit on lake trout at Quabbin. **Proposal rejected.**

- Discussed the issue of fish and wildlife fines.

- Expressed concern over the matter of dogs running and killing deer during snowy periods especially in the Western District

- Expressed concern over a proposal to establish a dam on the Merimack River at Sewall's Falls in New Hampshire as such a dam would threaten the Division's salmon restoration program.

The Board voted to appoint Dr. Mark Pokras to the Nongame Advisory Committee replacing Karsten Hartel who resigned. The Board bid farewell to Larry Fountain of West Springfield, whose membership on the Board had expired and welcomed Michael Roche of Orange who was named to succeed Fountain.

And the Board congratulates the many Division employees who were honored for excellence during the year. Among them are;

Dr. Thomas W. French — recipient of the Conservation Medal of the National Society of the Daughters of the American Revolution.

William E. Easte — Honored as Man of the Year by the North Worcester County Quabbin Anglers.

Richard Cronin — Honored as recipient of the first annual Wetherbee Award by Minuteman Chapter, Ducks Unlimited.

Ellie Horwitz — Honored by the Minuteman Chapter, Ducks Unlimited.

H Heusmann — Robert DeVeau Sportsman Award, Mystic Chapter, Ducks Unlimited.

Members Fisheries and Wildlife Board

George L. Darey, Lenox, Chairman

Nancy Begin, Topsfield, Vice Chairman

Colton F. Bridges, Grafton

John F. Creedon, Brockton, Secretary

Lawrence R. Fountain, W. Springfield, until October 1986

Dr. Gwilym S. Jones, Framingham

Michael P. Roche, Athol, from March 1987

Raymond W. Whitaker, Winchendon

A Canada goose leaves its mate to drive away an intruder

ADMINISTRATIVE STAFF
(non-program affiliated)

Boston

Richard Cronin, *Director*
Lewis Schlotterbeck, *Deputy Director, Administration*
Stephanie Shea, *Permits*
Anita Masterson
Cheryl Richardson
Henry Wadach

Westborough

(Field Headquarters)
Carl Prescott, *Deputy Director, Field Operations*
Stephen M. Henry, *Senior Planner*
Mary Berberian
Raymond Wheeler

FISHERIES

Peter Oatis
Assistant Director, Fisheries

Survey and Inventory

Biological surveys were conducted on sixteen lakes to determine their potential for trophy trout management. Temiscamie hybrid brook trout were released into Higgins Pond, Brewster following the passage of catch and release regulations for that water body. Approximately fifty-nine stream surveys were conducted to establish priorities for the stream bank acquisition program and to complete the data base needed to refine cold water production models for Massachusetts trout streams.

Fishing pressure and harvest for the Quabbin Reservoir fishery remained fairly stable despite dropping water levels. Landlocked salmon continue to grow rapidly during their first summer in the reservoir. Numerous 15 to 17" fish were reported caught and released but legal-sized 18" fish were uncommon. White perch are beginning to comprise a significant proportion of the total catch at Quabbin. Sampling was conducted during the fall to develop a better understanding of the mercury contamination problem that exists at the Quabbin. Biologists explored potential mitigative strategies that might be employed to combat the effects of metal contamination and low pH on the rainbow smelt and lake trout reproduction.

Low captures of brood stock, potential inbreeding problems and insecure water supplies at the East Sandwich Hatchery have prompted major re-evaluation of the Sea Run-Brown Trout Program.

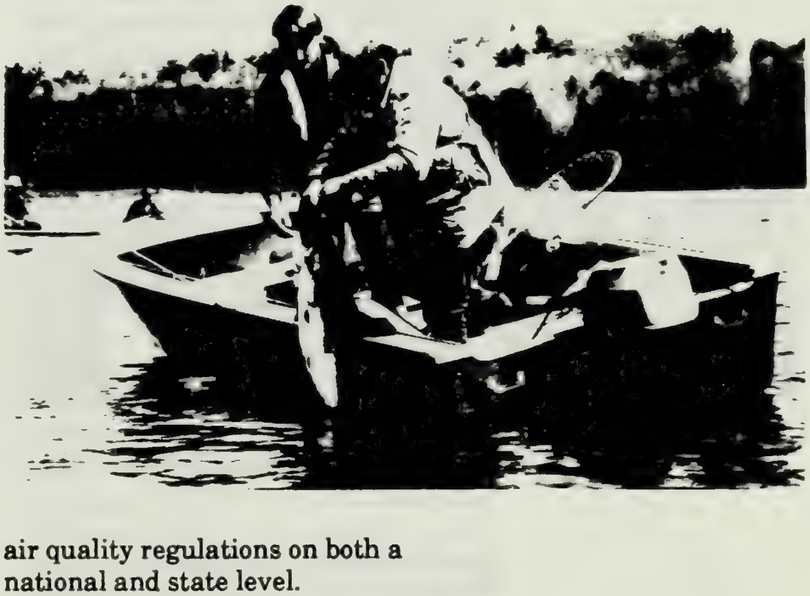
Acid Rain Investigations

Several studies concerning the implications of acidification on fish and wildlife resources are currently in progress or nearing completion as part of the cooperative Aquatic Research Program between this Division and the Massachusetts Water Resource Research Center at the University of Massachusetts. These studies include:

The Acid Rain Monitoring Project

Now in its fourth year of operations, this vital project conducted primarily by volunteers, has completed the classification of waterways of the entire state and is now tracking the status of acidification of our inland waters on an annual basis. The information generated is used to plan and evaluate mitigative actions taken to protect aquatic wildlife and to evaluate the effectiveness of recently implemented air quality regulations on both a national and state level.

Since their introduction to Quabbin in 1954, lake trout have been a self sustaining population in the reservoir providing excellent early season fishing



Stimulation of Mercury Methylation by Acid Deposition

This program investigates the microbial processes that cause mercury to enter the food chain rendering fish stocks unfit for human consumption.

Hydrologic Controls on the Chemical Response of Streams to Precipitation in Central Massachusetts

The ultimate goal of this research is to develop a predictive water chemistry model that will be useful in locating waters where toxic levels of aluminum mobilized by acid rain are likely to appear in streams and lakes.

Effects of Acid Precipitation on Salamander Communities

The level of acidification may not be noticeable over the long-term in many small bodies of water, yet the changes that occur in the early spring may be life threatening to many forms and life stages of aquatic species.

The Role of Sulfate Reduction in Mitigating the Effects of Acid Deposition in Lakes

The ability of a lake to buffer acid input is not governed only by the geology of the basin, but also by a number of biological processes. If sulfide is not oxidized but stored in its reduced form in lake sediments, it is capable of generating alkalinity. This project explores the relative importance of the processes which are capable of altering the alkalinity of many ponds situated within the Cape Cod aquifer.

Evaluation of Acid Mitigation Whetstone Brook

This study is part of a five-year investigation funded in cooperation with the United States Fish and Wildlife Service. Its goal is to evaluate the effectiveness of applying periodic doses of limestone to acid impacted streams. We are presently collecting pre-treatment chemical and biological information and securing the permits necessary to construct and operate the dosing device.

Evaluation of Lake Liming Techniques

Working in conjunction with Living Lakes Inc., a private corporation established by the coal and power industries, six lakes were treated with limestone to combat acidification. The six lakes were; Laurel Lake, Erving; North and South Ponds, Savoy; Round Pond, Plymouth; Shubael Pond, Sandwich; Wallum Lake, Douglas. Detailed biological and chemical monitoring will take place at these lakes over the next five years to assess the impact and potential benefits of the liming techniques employed. The entire cost of this study is being borne by Living Lakes, Inc.

Environmental Risk Assessment of the Hoosic and Housatonic River Basins

The goal of this investigation is to determine, through computer modeling, the potential impact of maximal permitted discharges into a river system experiencing low flow conditions on existing fisheries resources.

Fisheries Development

Trout Unlimited volunteers worked with Southeast and Connecticut Valley District personnel to install six wing-deflector dams and complete brush clearing along the Quashnet River, Falmouth, and to secure a number of log overhangs and place gravel along steep embankments of the Swift River just below the Windsor Dam.

With the completion of the comparative liming evaluation study of Great Pond and Ryder Pond, Truro (conducted in cooperation with the Massachusetts Audubon Society and the Division of Water Pollution Control) staff biologists were able to complete the Statewide Generic Environmental Impact Report on Pond Liming and obtain the necessary permits to treat eight ponds that met the criteria for liming.

The Roger Reed Hatchery (Palmer) reared 30,000 landlocked salmon smolts for the Quabbin Reservoir Fishery, as well as 3,700 northern pike and 4,800 tiger muskies, for release into designated lakes and ponds. Additionally, several thousand surplus landlocked salmon fry released to the Stillwater and Quinnapoxet Rivers in 1984 are just beginning to provide a modest salmon fishery in Wachusett Reservoir. This fishery will be monitored for the next few years to evaluate the growth and survival of the salmon that grow from the release of inexpensive fry.

Anadromous Fish Investigations

Connecticut River A great deal of time was spent with the Strathmore Paper Company negotiating their proposal to build and operate a power facility adjacent to the Turners Falls Power Canal. The canal is an integral part of the fish passageway at Turners Falls and there has been a great deal of concern about the potential impact of increased temperature and of chlorine on the passage of anadromous species. Additional time was spent in assessing the potential impact of the addition of a seventh turbine in the Cabot Generating Station at Turners Falls.

Pursuant to a request from the Connecticut River Salmon Commission, the Reed Hatchery was designated as a brood stock production facility. Under this agreement, smolt stocking in the Deerfield and Millers Rivers will be the responsibility of the White River National Salmon Hatchery. A total of 80,000 salmon fry and 9,000 salmon parr were released to various tributaries in the Westfield and Deerfield Watersheds to assess the potential of these basins to produce essentially wild smolts from the annual release of salmon fry.

Fish passage at Holyoke totalled 202 salmon and 231,079 shad while the Turners Falls Fishway successfully passed 12 salmon and 18,959 shad. Shad still experience a great deal of difficulty negotiating the gatehouse flows in order to pass the upper fishway and gain access to the Turners Falls Pools.

Merrimack River Securing adequate downstream passage at Lawrence and Lowell is still a problem that must be resolved if the restoration program is to achieve its full potential. Construction of a fishway at Amoskeag (N.H.) began in the fall of 1986. This facility will provide anadromous fish access to more of their historical spawning grounds in the summer of 1988. The construction of additional fishways along the main stem of the river is predicated on the numbers of fish using the fishway at Amoskeag. Fish passage at Lawrence totalled 98 salmon, 18,500 shad, 16,200 herring and 12,900 lamprey. The poor weather is thought to be the principal reason for the shad fishery not being as active as during the spring of 1986.

Aquatic Resource Education

This marks the first year that federal funds can be used to augment the Division's aquatic education program. Working with the volunteers formerly assembled under the Urban Angler banner, the program is now known as the Aquatic Resources Education Program. It still offers fishing clinics and special events that are the hallmark of the Urban Angler Program, but also includes funding for staff effort spent on Aquatic WILD and the production of educational material in a variety of formats. High points of activity in the program this year include recruitment and training of 50 master (volunteer) instructors in four different chapters. These volunteers have donated several thousand hours of effort in hosting successful aquatic programs at the Charles and Merrimack River Festivals, Borderland State

project
WILD
THE PROGRAM THAT
KNOWS NO BOUNDS
MASSACHUSETTS
AQUATIC RESOURCE
EDUCATION PROGRAM

Volunteer instructors Clayton Vancilette and Joe LaPorte of the Aquatic Resources Education Program man a booth at a sportsmens show.

Park, Jamaica Pond and the Worcester and Springfield Sportsmen's Shows as well as fishing clinics and ice fishing festivals across the state. The program obtained the services of artist Terry Talis who has agreed to prepare four posters depicting the freshwater fish species of the state. Five hundred fishing outfits including rods, reels and tackle were donated by the Berkley Fishing Line Company and the Fisheries and Wildlife Board voted for a statewide free fishing weekend (no license needed).

Technical Assistance

The amount of fisheries staff time needed to provide technical assistance to private developers as well as other state and federal government regulatory agencies is increasing rapidly. Major projects reviewed by fisheries staff include assessing the impact of several stream crossings by pipelines, highway relocations and transmission lines. Assistance to state agencies include sampling fish from several sites where the fish are suspected to be contaminated by metals or other toxic substances, the review of water pollution control regulations, and lake restoration plans, as well as monthly participation in meetings of the state Pesticide Board and Water Resources Commission. Biologists also cooperate with federal agencies such as the U.S. Army Corps of Engineers and the U.S. Soil Conservation service regarding the impact of varied agricultural practices and flood control devices on many streams in the western portion of the state. The benefits of this program are measured in terms of resources not lost through improper planning.

Fisheries Staff

Peter Oatis,
Assistant Director, Fisheries

Joseph Bergin

William Easte

David Halliwell

Stephen Henry

Richard Keller

Mary LaFleur

John Lindenberg

Robert Madore

Mark Tisa

Gary Zima

HATCHERIES

David Fredenburgh
Chief Fish Culturist

During Fiscal Year 1987, the hatcheries produced 1,168,600 fish weighing 575,389 pound. Of that number, 599,200 were classified as 9" plus.

Normal maintenance was carried out at all hatcheries.

The Sunderland Hatchery re-construction is basically still on hold. Hopefully within the next fiscal year some definite construction can take place.

All of the hatcheries are experiencing severe bird problems especially from Blue Herons. Steps will have to be taken to eliminate this problem.

In general, it was a good production year.

Species	**< 6"**	**6" - 9"**	**9 plus**	**12 plus**	**Tot. Fish**	**Weight**
McLaughlin						
Rainbow	160,925	900	41,580	146,304	349,709	183,390
Brook	85,000	19,100	103,585		207,685	52,999
Brown	97,900	74,003			171,903	20,905
Total	343,825	94,003	145,165	146,304	729,297	257,294
Palmer						
Rainbow			340	1,675	2,015	2,619
At. Salmon	9,224				9,224	228
At. Salmon-Quab.					100	500
Landlocked	10,000	2,000			12,000	440
Total	19,224	2,000	340	1,775	23,339	3,787
Montague						
Rainbow			64,063	19,319	83,382	63,268
Brook				13,875	13,875	11,126
Brown			4,675	4,675	3,894	
Total			64,063	37,869	101,932	78,288
Sunderland						
Rainbow			48,000	10,625	58,625	54,217
Brook				20,990	20,990	23,773
Brown				22,871	22,871	24,904
Total			48,000	54,486	102,486	102,984
Sandwich						
Rainbow			62,870	4,570	67,440	39,033
Brook	24,500	16,315	10,915		51,730	10,954
Brown	25,000	44,521	22,450	418	92,389	23,139
Total	49,500	60,836	96,235	4,988	211,559	73,126
Grand Total	91,824	151,989	343,803	245,422	833,038	505,609
	(320,725)*	(4,850)*	(10,000)*		(335,575)*	(9,780)*
	412,549	156,839	353,083	245,422	1,168,613	515,389

* fish transfered from McLaughlin Hatchery to other hatcheries

Fish Hatchery Staff

McLaughlin Fish Hatchery

Jennifer Ayre
Edward Bolduc
James Hahn --Hatchery Manager
Annette Kucharczyk
Earl Labonte
John McGurn
William Mikelk
Joseph Skowron
John Sousa
Susan Townsend
Carl Zobka

Bitzer Fish Hatchery

Harlan Buckmaster
Chester Kopinto
John Kopinto
Ralph Taylor-- Hatchery Manager
John Williams

Palmer Fish Hatchery

Robert Lucas
Michael Masley -- Hatchery Manager
Arthur Pellegri, Jr.

Sandwich Fish Hatchery

Alan Aittaniemi
Antone Fernandes, Jr.
Lawrence Hollings
Arthur Leonard
Vernon Lopez
George Moore
Lloyd Raymond -- Hatchery Manager

Sunderland Fish Hatchery

John Besse, Jr.
John Gromaksi
Douglas Isles
Frank Pietryka
Edward Siwicki
Thomas Smith

Game Farm Staff

(report p. 17)

Ayer Game Farm

Robert Bennett
Mark Brideau
Walter Dauderis
Richard Donohue
Stephen Foster

Sandwich Game Farm

Jack Almeida
Robert Gallagher
Ernest Green
John Prouty
Kenneth Weaver

WILDLIFE

Wayne F. MacCallum
Assistant Director, Wildlife Research

Birds

Waterfowl

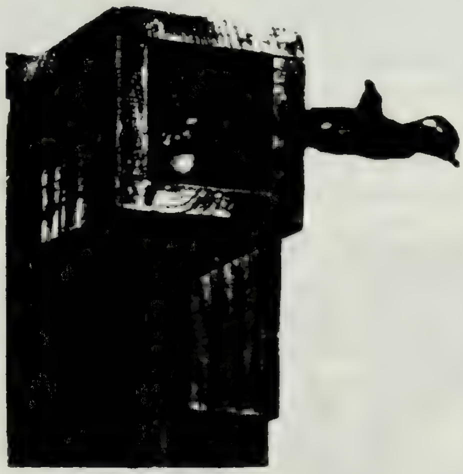
Pre-season Banding
A total of 367 waterbirds were banded during summer and fall trapping efforts. The total included 213 wood ducks, 109 mallards, 22 black ducks, 1 mallard X black hybrid, 3 blue-winged teal, 1 green-winged teal, 2 hooded mergansers and 1 common moorhen and 1 sora rail. Banding was accomplished by nest box hopping, bait trapping and airboat night lighting.

Mid-Winter Waterfowl Inventory
A total of 121,656 waterfowl were counted during the January 1987 mid-winter coastal survey. Black duck numbers were down from both last year (-6%) and the 10 year average (-10%). Merganser numbers were up as were scaup, scoters, oldsquaw and brant. Eider counts were the lowest in 25 years. Mallards, canvasbacks and Canada geese were down from 1986 but above the 10 year average. Mild conditions prior to the flights meant open water throughout the coastal area and wide dispersal of waterfowl, hindering completeness of the count.

Winter Banding
The winter of 1986-87 began with mild weather but then became very cold during mid-January. Snowfall was heavy and frequent, even on Cape Cod. As a result, winter conditions were near normal and trapping conditions after mid-January were favorable in contrast to previous years. A total of 567 black ducks, 39 mallards, 170 mallard X black hybrids, 5 pintail and 1 green-winged teal was banded by bait trapping and rocket netting.

Wood Duck Nest Structure Study
Wood duck and hooded merganser use on 15 new areas where plastic buckets were paired with boxes ran 21.9% for bucket and 39.4% for boxes. No hooded mergansers nested in buckets. Use of buckets and boxes on 14 areas with established wood duck nesting populations was 51% and 64.2% respectively. The success rate was similar at 84% and 86.7%.

Wood Duck Production
The 1986 nesting season was a good one with no major climatic disruptions. The 247 wood duck nest starts and 212 successful nests were the highest in the eight years the 50 study areas have been checked. The increasing population appears to be a reflection of reduced harvest achieved by the one bird bag restriction in 1982 followed by delaying the opening of the waterfowl season until after the start of the pheasant season during the past three years. The populations in the eastern coastal plain appear to be responding best. Worcester County wood duck nesting remains disappointingly low.



A newly hatched wood duckling leaves the nest to join the hen below

Use of nest structures was 46%. The success rate was 85.8% for wood ducks and 82.3% for hooded mergansers.

Evaluation of Experimental Zoned Waterfowl Seasons
The average duck harvest during the period 1983-1985, when Massachusetts was divided into 3 waterfowl hunting zones, was 25% below the harvest for the pre-zoning period 1978-1980 but 3% above the average for 1981-1982 when only 2 zones were used. Part of the reduction was due to a black duck harvest restriction plan. Duck harvest by zone was Berkshire - 2.3%, Central - 38.1%, Coastal - 57.5%.

Canada Geese
Measurements based on bill lengths of adult Canada geese provided by 269 hunters indicated that 68% of the geese were of the *Branta canadensis maxima* stock typical of resident Massachusetts geese. Since only 85% of our residents are this type, we inferred that 80% of the geese harvested are locally produced.

Thirty-eight percent of 68, 1/2 mile square plots located in 12 eastern Massachusetts areas contained some goose nesting habitat. Initial estimates of nesting goose populations indicate 1,900 pairs breeding in the 12 areas.

A total of 49,768 goose observations were made between September 1986 and February 1987. There were 50 observations of collars involving 42 to 44 individual birds. Collar and count data indicate that migration peaked in November. Virtually all collared transient migrants had left the state by mid-January.

A female woodcock sits tight on her eggs as they near the end of the 21 day incubation

Migratory Bird Census

Mourning Dove
Due to manpower limitations and the limited usefulness of dove survey information, the number of dove survey routes in Massachusetts was decreased from 18 in 1985 to eight in 1986 and 1987. The number of calling doves on three long-term routes decreased 50 percent from 1986 to 1987. Counts on eight comparable routes decreased 29 percent (110 to 87 doves) from 1986 to 1987.

Woodcock
Eleven randomized spring singing ground surveys were conducted in 1987. Based on these surveys, the Massachusetts woodcock breeding population index decreased 6.9% from 1986 to 1987.

Other Avian Projects

Wild Turkey
Massachusetts' eighth spring gobbler hunt was held in May 1987, with the three-week season (as in 1986) consisting of a one-week first segment (May 4-9) and a two-week second segment (May 11-23). The open hunting zone was expanded and now includes the following areas: Berkshire, Franklin, and Hampshire counties, that portion of Hampden county west of the west bank of the Connecticut River, and that portion of Worcester County west of State Route 31 and north of State Route 9. Hunters were allowed to apply for and could hunt during only one segment of the season, but could hunt anywhere in the open zone. A total of 7200 permits were allocated for each segment, of which 5686 were issued for the first period and 5174 for the second period. A record kill of 471 turkeys (342 1st period and 129 2nd period) was attained with an overall participation rate of 75.7% and an overall success rate of 5.7%. The Berkshire county kill was 243 (51.6%), with Franklin (89)

second and Hampshire (50) third. Adult males comprised 300 (64%) of the take.

Winter trapping was facilitated by abundant snow cover and Division personnel succeeded in capturing 41 turkeys for transplant. Nineteen were released on the Bolton Flats WMA, Bolton, and 22 were released on Naushon Island, Gosnold.

Falconry
During 1986 there were 34 active falconers. Six of them hold breeding permits. During this period 29 raptor salvage permits were issued. The number of falconer permits issued by type was as follows: 8 Master, 17 General and 9 Apprentice.

Mammals

Furbearers

Beaver
The 1986-87 beaver trapping season ran from November 15 to February 28 statewide as in 1985-86. Conibear traps larger than size #110 or the equivalent were not allowed after January 15. During this season, a total of 1371 beaver were taken by 104 trappers in 117 towns with a mean take of 13.2 beaver per successful trapper. This take represents an increase of 327 beaver (31.3%) over 1985-86. Harvests increased by 25 percent or more in all counties (except Berkshire and Norfolk) and in both regions. Berkshire county increased less than 10 percent; Norfolk county decreased 100 percent (1 beaver to zero). For the fourth consecutive year, the harvest in the Eastern region exceeded that in the Western region.

Otter and Fisher
During the 1986 otter season, 60 successful trappers took 94 otter in 68 towns in 10 counties for a mean take of 1.6 otter per successful trapper. This compares with a harvest of 98 and a mean take of 1.8 in 1985.

The fisher harvest increased from 152 in 1985 to 201 (the highest take yet recorded) in 1986, with 57 successful trappers taking an average of 3.5 fisher each among 54 towns in six counties. In 1985, 55 successful trappers took an average of 2.8 fisher each. Worcester (29), Essex (12), Franklin (12), and Middlesex (12) counties and Zones 02 (24), 03 (22), and 05 (22) yielded the most otter, while Worcester (131), Franklin (35), and Middlesex (13) yielded the most fisher.

A total of 200 fisher carcasses were received from cooperating trappers. The mean age of fisher in 1986 was 1.51; however, this is not directly comparable to 1985 (1.39) since animals aged 3.5 and older were grouped in 1986. Nineteen (70%) of 27 fisher aged 1.5 and older showed evidence of reproductive activity.

Bobcat
A total of 25 bobcats was taken in 1986-87, including 7 by hunting, 11 by trapping, and 7 road kills. The mean take per successful hunter was 1.0 and per successful trapper was 1.8. Six trapped bobcats were taken in November and five in December, while March was the most successful month for hunting. During the 1986-87 season, bobcats were taken in 21 towns in 5 counties.

A radio collared bobcat makes her escape after being checked by a graduate student from the Cooperative Wildlife Research Unit

Coyote
A total of 57 coyotes were taken by 40 sportsmen in 41 towns and seven counties during the 1986-87 hunting season. The majority (38, 67%) were

taken in November. Most (35%) were taken by hunters aiming specifically for coyote. At least two other mortalities, including one road kill and one depredation kill were recorded.

Furbearer Tallies

A total of 24 furbuyers submitted annual reports; five did not buy any furs from Massachusetts trappers or hunters. The remaining 19 purchased 19,883 muskrat, 819 mink, 49 otter, 6163 raccoon, 279 red fox, 42 skunk, 110 gray fox, 755 beaver, 58 opossum, 11 bobcat, 112 fisher, and 8 coyote.

The results of one fur auction held by the Bay State Trappers' Association was reported; tallies of the other three auctions were not sent to the Division. The average prices, based on the one auction, were: muskrat, $4.50; mink, $27.68; otter, $44.00; raccoon, $18.63; red fox, $29.99; gray fox, $30.72; beaver, $16.29; opossum, $1.34; bobcat; $37.59; fisher, $123.43; and coyote, $30.00.

Other Mammal Investigations

Black Bear Distribution and Harvest

A total of 941 bear hunting permits were issued for the 1986 hunting season. A total of 18 bear were taken during the two-week split season, including 15 during the first segment and three during the second segment. Eight males and 10 females were taken in Berkshire (5), Franklin (7), Hampshire (4), and Hampden (2) counties. One non-hunting mortality (a road kill) was recorded. Six reports of problem bears were received.

Whitetailed Deer

During the 1987 fiscal year, the whitetailed deer management program continued to grow and improve.

The major focus of research efforts was aimed at analyzing herd growth and conditions across the state. Data collected during the hunting season provided information necessary for the management of an estimated 42,000 deer statewide. During the 1986 deer hunting season, approximately 70,000 hunters harvested 5,612 deer. Division staff collected biological data from almost 40 percent of the deer harvested. Mean yearling male antler beam diameter (18mm) and deer weights indicated that the increasing deer herd size has not affected the good condition of deer and their range.

In an effort to better understand deer population dynamics, the deer project leader developed a computer-based population model. This model is currently being tested by biologists and managers throughout the Northeast. Following testing and modifications, the model will be used as a management tool that will provide objective analysis of deer populations based on harvest and age data collected during the hunting season. The Division also sponsored a fawn mortality study through the Massachusetts Cooperative Wildlife Research Unit at the University of Massachusetts (see that section of this report for details).

During 1986, Environmental Police Officers submitted 849 reports of deer dying of non-hunting related causes. These reports help assess the need to control deer numbers in certain areas of the state. Statewide, 691 deer were killed in deer-vehicle accidents.

The basis of deer management in this state is the control of the harvest of does during the shotgun deer season using the antlerless deer permit system. Approximately 37,000 sportsmen applied for antlerless deer permits in 1986. The Division issued 9,425 permits covering all 14 management zones. These permits were issued to manage herd growth in each zone in order to maintain deer at population levels compatible with human population densities and range carrying capacity. A $5.00 permit fee generated over $47,000 to defray costs associated with running the deer management program. Bowhunters and primitive weapon hunters contributed another $125,000 to Division programs through the purchase of a stamp that allows them to hunt during a special three-day season. In addition, deer hunters in this state contributed approximately $35 million to the state's economy through purchases associated with hunting (i.e., hunting equipment, transportation, food and lodging).

As a result of research concerning land use trends, deer population indices, and deer-human interactions; the Division is considering an increase in the bag limit of deer from one to two in management zones 12, 13 and 14 (Barnstable, Dukes and Nantucket Counties). This decision would create consistent regulations across the state and would allow hunters the opportunity to harvest two deer in these three areas that are experiencing high development pressures resulting in decreased habitat and higher deer densities.

Other Research Studies

(conducted through the Massachusetts Cooperative Wildlife Unit)

Harvest Surveys and Analyses

A computer analysis of the Massachusetts Division Fisheries and Wildlife hunter survey procedures indicated that sampling errors may have been responsible for overestimates in previous surveys. A sample survey and a follow-up was conducted in 1985-86. This showed that those persons responding to the initial survey were different from those requiring a follow-up response with respect to hunting effort, harvests and days afield. Based upon these findings, a revised sampling design was used in 1986-87. The initial telephone survey was followed by a small survey and two follow-ups. Data are now being compiled and recommendations will be made for procedures for future surveys.

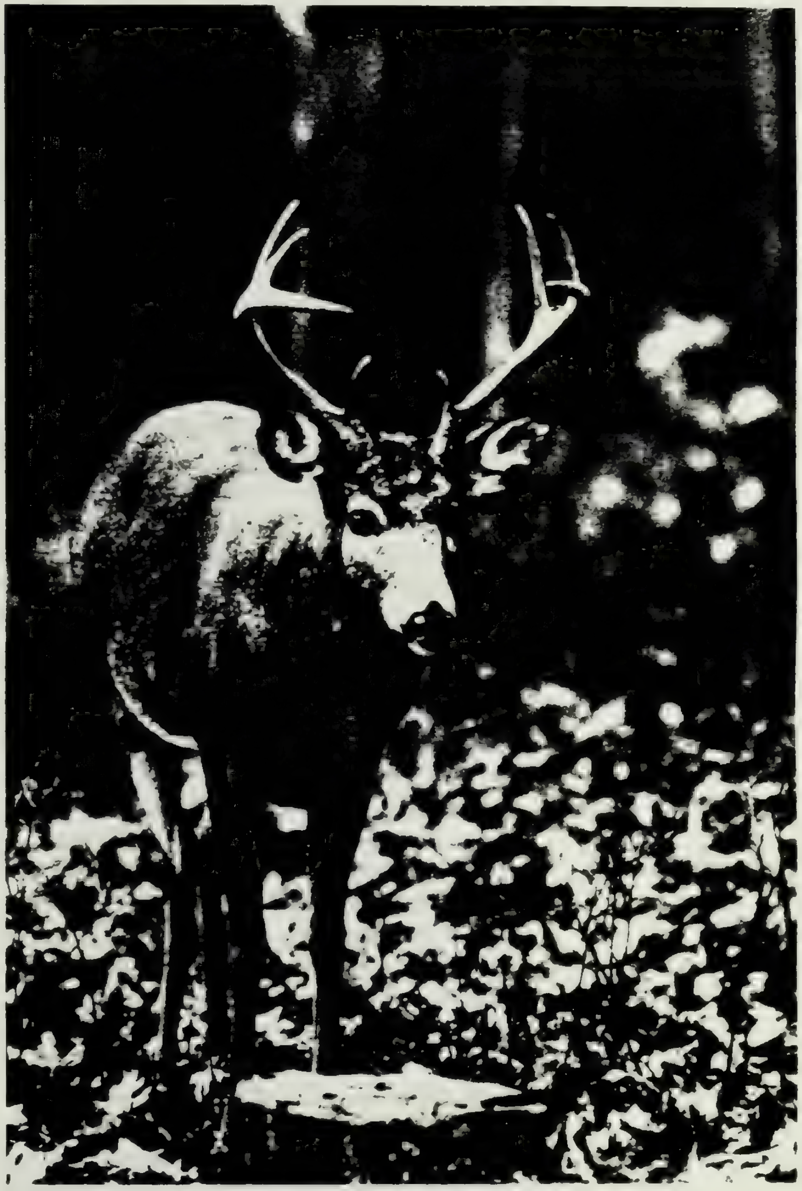
Movements and Mortality of Whitetailed Deer Fawns

Five radio-collared fawns were monitored from June to December 1986. Mortalities, movements, and habitat use were recorded. Two uncollared fawns belonging to a radio-collared doe were also monitored for mortality through activities of their dam.

During the shotgun deer season in December, data were collected at two biological check stations in Zones 01 and 03.

Winter capture of adult females was initiated during January-March. Fifteen bait sites were established using apples as bait. Twenty-five deer were captured in traps with four recaptures. Three adult females were radio-collared, ear-tagged and released; all other deer were ear-tagged and released.

Deer biologists have developed a model of the dynamics of Massachusetts' growing deer herd , a move which will facilitate fine tuning the state's deer management program.



From mid-February through March, deer were darted and immobilized at the remaining bait sites. Five adult does were immobilized, collared, and released. All eight adult females captured through the winter period were monitored through parturition in May. Intensive ground searches were conducted for their fawns. Farmers in the area were sent letters and asked to report fawn sightings in May and June.

Ground searches for fawns were conducted from May 20th to June 13th. Sixteen fawns were captured and instrumented with radio collars. These fawns will be monitored through Fall, 1987.

Wild Turkey Population Dynamics
Survival, productivity, and habitat preferences of eastern wild turkeys were studied during 1983-1985 in western Massachusetts. Survival data were obtained on 65 radio-tagged birds. Winter survival for all age and sex classes averaged 93% and mean weight for hens increased through the winter. Female survival was lowest (78%) during the period of dispersal and nesting. Predation was the dominant (75%) cause of mortality for adult and yearling hens.

Thirty-three of 36 (92%) radio-tagged hens attempted to nest. Adults nested at a significantly higher rate than did yearlings. Seventeen of 31 (55%) hens successfully hatched a clutch. Predation on eggs or on the hen accounted for most nest losses. Poult survival through the summer was 23%. Winter habitat use data were collected on five flocks from January-March in 1984-85. Use-availability analyses indicate that flocks used cropland, pasture, and softwood habitat types more, and hardwood, mixed woods, and abandoned field types less than expected. Flocks spent more time feeding on seeds and corn in manure spreads than on any other single source. Turkeys in monitored flocks used softwood stands and adjacent pastures during periods of deep snow.

Use-availability analyses indicate that turkey broods preferred cropland and abandoned field habitats during the early brood period. Use of abandoned fields was lower during the late brood period and use of mixed forest stands increased. The dominant understory component in hardwood, mixed and abandoned field habitats types was blackberry (*Rubus spp.*). Sites used by broods had predominantly herbaceous ground cover.

Black Bear Reproductive Success and Cub Survival
Fluctuations in the recruitment rate of young into the population appears to be one way in which bear populations naturally limit densities. Data from 18 adult female black bear bearing 62 cubs in 27 litters were analyzed to provide insights into black bear nutrition and population dynamics in western Massachusetts. Intensive observation of feeding habits and nutritional analyses of food items indicated that the nutritional status of pregnant females affected their reproductive success. Twenty-six of 28 females with access to high fat and carbohydrate diets produced cubs, while 10 females with low carbohydrate fall diets failed to produce cubs. Forty-one cubs were followed intensively from birth until 3 years of age. Overall mortality of cubs by 1 year was 41% and by 2.5 years (subadult) was 61%. Male cub mortality was much higher than female cub mortality, even before family breakup. Most cub mortality occurred between 1.5 and 5 months of age. Some of the factors influencing cub survival were: human interactions, experience and behavior of the sow, and disease. All female cubs surviving to adulthood stayed within their natal area. Eight male cubs survived until dispersal, but 6 to 8 were shot by hunters while dispersing at age 2.5. Only 2 of 21 male cubs were known to survive to adulthood. There was no evidence of competition for food or space. At present, exploitation levels and fall mast availability appear to control bear population densities through the number of female cubs born.

Game Releases

A total of 47,249 pheasants, 3,315 quail and 731 snowshoe hare were released immediately prior to or during the 1986 hunting season. An additional 4,800 pheasant were provided to clubs participating in the Cooperative Pheasant Rearing Program.

The pheasants were raised at the Ayer and Sandwich Game Farms. All quail were raised at the Sandwich Game Farm. The snowshoe hare were purchased from a New Brunswick vendor.

Habitat Improvement

Forest Management Program

Forest program work during Fiscal Year '87 focussed on the following four areas: location of wildlife management area (WMA) property boundaries, collection of forest inventory data, contracting of commercial cutting operations, and sampling of ruffed grouse and songbird populations on a WMA undergoing commercial cutting.

Property boundaries were determined and marked in the field for portions of the Hiram Fox WMA and the Peru WMA. Forest inventory was conducted on both of these areas, covering 280 acres at Hiram Fox, and 650 acres at Peru. Forest inventory was also conducted on 850 acres of the Fox Den WMA (property boundaries were established in F.Y.'86). Forest cover type and boundary maps were prepared for all acreage inventoried.

Commercial forest cutting operations were initiated on the Hiram Fox WMA, the Crane Pond WMA, and the Sunderland Fish Hatchery. The contract at Hiram Fox exchanged 350,000 board feet of timber and 700 cords of firewood for machine time and building materials for access road construction (bulldozer and backhoe time, process gravel, geotextile material, culverts, bridge construction, and installation of locking gates), and establishment of wildlife openings.

The contract at Crane Pond exchanged 37,000 board feet of timber and 200 cords of firewood for processed gravel used for road construction and repair on the Crane Pond and Martin Burns WMA's. The contract at Sunderland exchanged 18,000 board feet of small red pine timber for machine time to prepare a gravel bank for excavation.

The second annual ruffed grouse drumming census and breeding songbird census were conducted at the Hiram Fox WMA in April and June, 1987 respectively. The ruffed grouse census was conducted by the Division Forester, and located four drumming males on 500 acres (the FY'86 census had located three drumming males on the same 500 acres).

The songbird census was directed by the State Ornithologist with assistance from the Western District staff. The songbird census covered 550 acres, and recorded 49 species (the FY '86 census had recorded 55 species on the same 550 acres; the entire FY'86 census covered 1,000 acres, and recorded a total of 62 species).

The forestry program continues to benefit from interaction with the Massachusetts Cooperative Wildlife Research Unit and the University of Massachusetts Department of Forestry and Wildlife. A forestry graduate student, and a senior undergraduate student in wildlife were hired from the Department, and conducted most of the 1,780 acres of forest inventory described above.

Work planned for Fiscal Year 1988 includes additional property boundary location and forest inventory on the Peru WMA (1,500 acres remain to be done), along with additional commercial cutting and access road construction on the Hiram Fox WMA. The ruffed grouse census and breeding songbird census are scheduled to be repeated.

Statewide Development

The Statewide Development Project is charged with the operation of Wildlife Management Areas and the construction and maintenance of nesting structures.

Wildlife management area operations include actual habitat management, as well as public access work, planning, and area administration of such events as controlled hunts.

Nesting structure work includes the erection and maintenance of wood duck nesting boxes, osprey nesting platforms, and bluebird nest boxes. Loon nesting rafts are also constructed and maintained on Quabbin and Wachusett Reservoirs. The following is a summary of work done during fiscal year 1987.

- Buildings: Maintained 9 buildings on 4 areas, and constructed one shed for storage.
- Dams: Maintained 6 dams on 3 areas.
- Bridges: Maintained 3 bridges on 3 areas.
- Roads and Trails: Maintained 61.6 miles of roads and trails on 15 areas.
- Parking Lots: 84 lots were maintained on 19 areas.
- Waterfowl Blinds: Waterfowl blinds (15) were maintained on 2 areas.
- Signs and Boundary Markers: Erected 850 signs on 18 areas and marked 34.6 miles of boundary. Maintained 1439 signs on 24 areas and checked 101.8 miles of boundaries on 30 areas.
- Tree and Shrub Planting: Planted 166 shrubs and 260 trees on 3 areas.
- Herbaceous Seeding: Planted and top dressed 132 acres on 5 areas and oversaw cooperative farming of 848 acres on 12 areas.
- Vegetation Control: Unwanted brush was controlled with a tractor drawn brush cutter, by handcutting, and with herbicides. A total of 271 acres on 16 areas were cut and 55 acres on 4 areas were herbicided.
- Nesting Structures: Erected 296 wood duck boxes, 52 bluebird nest boxes, 8 osprey nesting platforms, and 8 loon nesting rafts. Maintained and checked 883 wood duck nest boxes and 225 bluebird nest boxes.
- Water Level Management: Manipulated water levels to encourage emergent vegetation over 160 acres on 1 area.
- Managed Public Hunts: Managed hunts were held on 4 areas.
- Prune and Release Trees: Pruned and eliminated vegetation competition from around 105 fruit-bearing trees and shrubs.
- Gates: Constructed 35 gates on 13 areas and maintained 27 gates on 7 areas.

Additional time was spent in administering the project, inspecting areas, and maintaining equipment used on the project.

Wildlife Staff

Wayne F. MacCallum,
Assistant Director, Wildlife

Robert Bellville

Richard Burrell

James E. Cardoza

Ellen Cocaine

Thomas J. Early

Marcia Hartleb

H W Heusmann

E.M. Pollack

John Scanlon

Dr. Steven Williams

NATURAL HERITAGE
AND
ENDANGERED SPECIES PROGRAM

Dr. Thomas French
Assistant Director, Natural Heritage and Endangered Species

During this fiscal year, the Nongame and Endangered Species Program and the Massachusetts Natural Heritage Program combined the names of the two programs and adopted the Natural Heritage and Endangered Species Section as the new name of the entire program. This became effective after approval by the Fisheries and Wildlife Board in February, 1987.

The most significant programmatic development during the year was the Section's involvement in the state Wetlands Protection Act regulations. In July, 1986, a law adding wildlife habitat as a protectable interest under the Wetlands Protection Act was signed into law. A technical advisory committee was formed to assist the Department of Environmental Quality Engineering in formulating regulations to implement the new statutory interest in wildlife habitat in wetlands. Fisheries and Wildlife personnel were actively involved in drafting the new regulations.

By the end of the fiscal year, a final draft of the regulations was issued that incorporates special stronger protections for "Estimated Habitats" for state-listed rare wetlands wildlife, as determined by the Natural Heritage and Endangered Species Program. For the purposes of the rare wildlife habitat protections only, wildlife was defined as including both vertebrate and invertebrate animal species, but not plants. The regulations provide that the Section must be consulted when work is proposed in wetland resource areas within Estimated Habitats for rare wildlife and the Section's opinion regarding anticipated impacts due to proposed alterations is presumed correct. These regulations, when adopted, will represent the first habitat protection expressly for rare and endangered species in the Commonwealth.

In addition, during the development of the regulations the Section also agreed to provide "certification" for Vernal Pool Habitats, seasonally wet depressions that provide crucial breeding habitat for several species of amphibians and uncommon invertebrates. Under the draft regulations, vernal pools would be protectable only if they occur in a wetland resource area and have been certified as functional vernal pools. The amendments to the Wetlands Protection Act regulations are scheduled to take effect November 1, 1987.

A majority of the Section's funding comes from voluntary contributions from the general public on the state income tax form. The final figure as of August, 1986 from the third year of this revenue raising mechanism is $260,308 for tax (calendar) year 1985. This represents a 9.5% decline from the previous year and an overall 33% decline from the original 1984 figures of $388,791 for tax year 1983. The contributor rate for tax year 1985 was 3% of eligible tax filers and the average contribution was $4.04.

In an effort to reverse this decline in revenue, the Section continued the consultant services of the full-time, in-house promotional manager hired in December, 1985 to develop strategies and materials that will ensure that the efforts of the Section to protect endangered and other nongame wildlife are better known to the contributing public. Toward this end, the Section produced a full color poster entitled, "Help Build a Future for Wildlife" and featured the Eastern Bluebird and a bird box. In December, 1986, a bill that broadens the number of income tax filers that can contribute on the tax form was signed into law. The law allows individuals who owe money to add a contribution to their tax due, whereas previously contributions on the tax form could only be deducted from a refund. The change will become effective for taxes collected for tax year 1987.

During fiscal year 1987, the Section's budget as appropriated by the legislature was $295,308 from the Nongame Wildlife Fund and an additional $106,041 from the General Fund for part of the continued consultant contract with The Nature Conservancy. (The reserve balance in the Nongame Wildlife Fund must cover operating costs which exceeded revenue raised from tax year 1985).

In July, 1986, the Program's comprehensive endangered species data bases were transferred electronically from a mini computer terminal to a micro computer (IBM PC AT). The new setup, besides being more economical, makes the data bases considerably more accessible and thus, more useful. In January, the Section acquired much needed additional office space at its Boston Office.

In addition to advising the Section, the Nongame Advisory Committee addressed the following issues at their monthly meetings:

approval of an early statewide phaseout of toxic shot,

discussion of how to control the spread of troublesome aquatic plants,

approval of revisions to the Wildlife Sanctuaries regulations,

recommended the name change to the Fisheries and Wildlife Board,

investigated the feasibility of an urban wildlife program,

recommended that ferrets not be legalized,

recommended funding of certain Small Research Contracts.

Land Protection and Environmental Review

The Section continued to be active in reviewing environmental impacts of proposed projects on rare species and their habitats through the MEPA process and the DPW, the federal Consistency Review, Corps of Engineers' public notices, as well as by request from private consultants. Over 1,100 projects were reviewed in fiscal year 1987. Sixty town Open Space Plans were reviewed for inclusion of significant rare species habitats and natural community sites as priorities for protection.

The Section's Natural Heritage Areas Registry continued to contact public land owners to try to secure nonbinding protection agreements for endangered species habitats. Site visits and consultations were conducted in about a dozen towns with appropriate federal, state (mostly DEM), and town officials or land managers. Program staff worked with The Nature Conservancy on finalizing a management agreement with the town and the state Division of Conservation Services for the Katama Plains in Edgartown, a recently protected grassland that provides habitat for a dozen endangered species. The Program continued to work with other Division staff and The Nature Conservancy on land acquisition projects to protect key endangered species habitats. Two acquisitions were concluded during the fiscal year: a 14-acre addition to the Division's Mashpee pitch pine barrens property and a 120-acre addition to the Division's Elbow Meadow area in Tyngsborough.

Research and Inventory

The summer of 1986 saw a wide variety of research and inventory projects underway partly as a result of the Section's first Small Research Contracts Program. Of 36 proposals received, 20 were funded at a total cost of $11,265.

During the winter of 1986-87, the Section received 23 proposals and funded 16 under the second year of the Small Research Contracts Program for 1987 field season projects.

Plant and Natural Communities
In August, the list of Endangered, Threatened and Special Concern plant species was added for the first time to the official regulatory list (321 CMR 8.00) of state endangered species by the Fisheries and Wildlife Board. Botanical work included supervision of eight projects under the 1986 Small Research Contracts Program ranging from propagation experiments of selected endangered plants to population biology studies of rare Coastal Plain pondshore plants. Some of the notable discoveries of new localities of rare plants were for: Swamp Lousewort, Lesser Snakeroot, St. Andrew's Cross, Climbing Fern, Eastern Silvery Aster, and Nodding Pogonia.

In February, a new position of plant ecologist was added to the staff to inventory and help manage and protect the state's exemplary natural communities.

Invertebrates
In August, the Fisheries and Wildlife Board approved the addition of invertebrates to the state's official list of endangered species (321 CMR 8.00 for the first time). The list consists of 85 species of invertebrates ranging from molluscs to crustaceans to numerous insects. In 1986, six projects inventorying invertebrates were funded through the Small Research Contracts Program including projects on: rare dragonflies and damselflies, the endemic Decodon Stem Borer Moth, American Burying Beetle, and rare freshwater aquatic invertebrates. Staff also inventoried Nantucket for the declining and endangered Regal Fritillary butterfly.

Vertebrates
Numerous and varied inventory, research and management projects were conducted on vertebrate wildlife in fiscal year 1987. Through the 1986 Small Research Contracts Program, the Program funded projects such as inventories for Eastern Spadefoot Toad and Blanding's Turtle and research into the effects of acid precipitation and breeding strategies on populations of Jefferson Salamander. Inventories for new occurrences of the Bog Turtle continued in Berkshire County. A grassland bird ecology and management study at the Westover Air Force Base focussing on Upland Sandpipers and Grasshopper Sparrows was initiated with financial support from the US Air Force.

Special Projects

Peregrine Falcon Restoration
One territorial pair of peregrine falcons was present in downtown Boston throughout the summer of 1986. This pair consisted of a male from the 1984 Boston release that had also returned in 1985, and a female released in Toronto, Ontario in 1984. The pair continued to be seen in the city sporadically throughout the winter.

In March 1987, the same pair was seen displaying courtship behavior and by April 13th, the first egg was laid on a 16th floor ledge of the J.W. MacCormick Post Office and Court House Building. The clutch of four eggs was completed on April 19th but the eggs were apparently broken by the falcons on the same morning. By May 4th, the female had recycled and began laying on a ledge adjacent to the first site. Since the next two eggs were laid on two different ledges, it was clear that the pair was still not settled.

In an effort to prevent a second failure, a decision was made to intervene. The first four eggs of this second clutch were taken as each was laid and dummy eggs were substituted. A fifth falcon egg was laid and left in the nest but it too was later broken by the falcons. The four removed eggs were sent to the Peregrine Fund in Boise, Idaho where all four were hatched in an incubator. These chicks were later released in the Adirondacks of New York.

Because of construction planned to begin on the roof of the Post Office, the pair would not have had the six weeks necessary to raise their own chicks before being disturbed. Therefore, two three-week old chicks were returned to the pair and were successfully raised. They fledged on June 26th and 29th and stayed with the adults throughout the summer.

This was the first nest of Peregrine Falcons anywhere in Massachusetts since a nest that failed on Mt. Tom in 1951.

Another important event was the discovery of a lone female Peregrine in Springfield. It was first noticed in early June and remained at least through July, 1987. This bird was originally released in Toronto, Ontario in 1985.

Bald Eagles Restoration & Survey
Eight young eagles that were received from Cape Breton, Nova Scotia on June 20, 1986 were released from the hack tower at Quabbin Reservoir on August 12th (6 birds) and August 14th (2 birds). All eight remained in the area taking food set out for them on a nearby island. They quickly became self-sufficient, but still returned for food when it was available.

On June 19, 1987 eight additional young eagles were received from Nova Scotia for the upcoming fiscal year 1988 release.

One of the eagles released in the first year of the program has been sighted repeatedly in the Quabbin area

The winter 1986/87 eagle survey was held on January 9, 1987. A total of 43 bald eagles (24 adults and 19 immature) and two adult golden eagles were counted. Both golden eagles and 35 of the bald eagles were seen at Quabbin Reservoir. The other eight birds were seen at five different sites around the state.

Plymouth Red-bellied Turtle
The contract with Dr. Terry Graham to conduct research on the natural history and the limiting factors of this endangered turtle was continued.

During the spring of 1986, a total of 24 clutches of eggs were discovered. From these nests, 105 hatchlings were retained for "headstarting" over the winter and were released back into the wild on June 8, 1987. The New England Aquarium, Berkshire Museum, and Dr. Graham provided facilities to headstart these young turtles.

Headstarted turtles were released into eleven ponds to bolster existing but weak populations, and for the first time, a new population was begun. In the future, other new ponds will be repopulated on the fringes of the existing range until a larger part of the historic range is reinhabited.

The 1987 release of over a hundred hatchlings was a significant increase from the 33 released in 1986. This increased effort was made possible by the cooperation of seven organizations that provided rearing facilities for the turtles.

Piping Plover
On January 10, 1986, the Piping Plover was listed as a federally threatened species by the U. S. Fish and Wildlife Service. Growing concern for this species has stimulated increased research and survey efforts in order to develop a viable recovery plan for the species. Natural Heritage Section Zoologist, Dr. Scott Melvin, has been appointed as a member of the national

Recovery Team and is directing research and management efforts in Massachusetts.

Observers reported a total of 139 breeding pairs of Piping Plovers from 51 sites in Massachusetts in 1986. This increase over the 1985 total of 132 pairs reflects more thorough censuses at several sites and the discovery of nesting plovers at two sites that had not been previously surveyed, rather than an actual statewide population increase. All but nine pairs occurred south of Boston and 70 pairs (50%) occurred on Cape Cod. The mean number of pairs per site was 2.7, with a range of 1 to 13 pairs.

Productivity was highly variable between sites, ranging from 0 to over 2 chicks fledged per nesting female. Threats reported from various sites included disturbance and direct mortality of eggs and young from recreational beach-users, off-road vehicles, dogs, mammalian predation (foxes, skunks, and raccoons), and avian predation (gulls and crows).

For the second summer, studies relating to the population dynamics, habitat requirements, and management needs of the Piping Plover was conducted by Laurie MacIvor with partial funding from the Natural Heritage and Endangered Species Section. Under the supervision of staff Zoologist, Dr. Scott Melvin, this study has been focussing on the plovers at Coast Guard Beach where human disturbance of the plovers if frequent.

Tern Inventory and Management

Results of the fiscal year 1987 Massachusetts Tern Inventory, coordinated by State Ornithologist Bradford G. Blodget, paint a picture of continuing stability. Generally there was little dramatic change in 1987 when compared to last year's results.

For the third consecutive year, Common Terns increased, reaching 8,869 pairs at 24 sites, ahead 14 percent over 1986. The Common Tern population in Massachusetts now stands at its highest level since 1970, when 9,000 pairs were estimated. This evidence of slow increase, the natural creation of valuable new nesting habitat and growing indications that large gull populations may be starting to decline, all auger well for the Common Tern's outlook in our state.

Roseate Terns were estimated at 1,697 pairs at 6 stations — essentially the same as last year's results of 1,746 pairs. Ninety-two percent of the Roseates were attached to Bird Island in Marion. The Roseate Tern is a proposed federally "Endangered" species. Arctic Terns increased to 29 pairs from 24 pairs last year.

Least Terns continue as our most widespread species with 2,109 pairs reported from 41 sites. Ninety-eight percent of these small terns are found from the sandbars at the mouth of the North River southward.

Osprey

The osprey population continues to increase rapidly in Massachusetts since the ban of DDT in 1972. In fiscal year 1977, a total of 137 nests were occupied (up 18% from 116 the previous year); one hundred nests were successful (73%), producing a record 218 fledged young (up 31% from 1986). Each successful nest produced an average of 2.2 young.

The nesting range of the Osprey is expanding very slowly in Massachusetts. In 1987, a milestone was reached with the appearance of a "housekeeping" or prospecting pair at Duxbury Marsh. Program personnel remain hopeful that pairs will someday establish themselves northward to Essex County. During fiscal year 1986, eight new nest poles were installed, bringing to 39 the total provided since 1980. Installations were made at: Pinquicksett Cove-Barnstable, Back River-Hingham, North and South Rivers-Marshfield, Cody Park and Mosswetusset Hummock-Quincy, Saquish Neck-Plymouth, and Duxbury Marsh-Duxbury.

Bill Davis places a newly banded osprey back onto its nest.

Short-eared Owl
The second year of a scheduled three year study of the population dynamics, habitat use, and management needs of the Short-eared Owl in Massachusetts was completed in fiscal year 1987. This project was conducted by University of Massachusetts graduate student, Randy Tate, under the direction of Section Zoologist, Scott Melvin. Ten breeding pairs were confirmed on Nantucket and three additional territories were occupied by owls whose breeding status was undetermined. Four breeding pairs were confirmed on Tuckernuck with additional birds of undetermined breeding status found on one portion of the island. Breeding territories occurred primarily in maritime heathland (moors) which is itself endangered.

Common Loon
For the third consecutive year, the Division of Fisheries and Wildlife, the Metropolitan District Commission, and the Massachusetts Audubon Society, cooperated in loon monitoring and management efforts at Quabbin Reservoir. Some financial support was provided by the North American Loon Fund. During 1986, five pairs of loons produced 7 nests and at least 11 eggs at Quabbin Reservoir. Three chicks were known to have fledged.

Great Blue Heron
A complete survey of all known or suspected Great Blue Heronries was accomplished between April and June, 1987. Thirty-three sites were inspected with 14 found abandoned or inactive and 19 active. Findings indicate that an upward trend in the sites' nesting populations, evident from 1979-86, has ended. Estimated total nesting pairs in 1987 was 284, approximately level with the previous two years' results. A record 308 pairs were estimated in 1985. Mean colony size rose from an estimated 9.8 pairs/colony in 1986 to 14.95 pairs/colony. Colony size ranged from 2-46 pairs. Nine Worcester County sites harbored 150 active platforms (53 percent of the state total).

Productivity has been consistently excellent in these heronries since close monitoring began in 1979. In 1987, a record 719 young were produced in the 19 active colonies. Mean brood size was 3.17. This survey effort has shifted to a bi-annual schedule and will be operated again in 1989.

Eastern Bluebird
During fiscal year 1987, the Demonstration Bluebird Trail at High Ridge Wildlife Management Area in Westminster and Gardner was completed. A final set of 70 boxes was installed with the assistance of the Westminster Cub Scouts, bringing the total boxes to approximately 250. As bluebirds, featured on the Program's fiscal year 1987 promotional poster, respond quite readily to human help, it is hoped that visitors to the trail will be inspired to develop their own trails. A seven-page pamphlet packed with information about "blue robins" and how to attract them was developed by the State Ornithologist and is available upon request.

A record 9 pairs of bluebirds were found along the demonstration trail in fiscal year 1987, up from 8 pairs in fiscal year 1986. In future years, the trail will be maintained in top condition for the enjoyment of the visiting public.

Purple Martin
Efforts to expand the population of these large swallows have proven disappointing. As of June 30, 1987, 42 purple martin houses were in service at 37 sites. Utilization rates have been very poor — especially so at "prospecting" sites.

All new construction of units in Division shops ended in 1984 and the lst new Division-built units were installed in 1985. Efforts began in 1987 to relocate prospecting units unused in 1982-86. Overall, our results indicate that installation of boxes is useful in augmenting and strengthening existing colonies, but ineffective as a means of building the species' range via new colony establishment. The reasons for the poor response are difficult to determine. Existing martin colonies exist only locally in southeastern Massachusetts and coastal Essex County.

Indiana Bat
Two bat hibernacula were checked in 1987. On February 5, the Chester Macia Mine was checked by Tom French and Ellie Horwitz in conjunction with media representatives who were preparing a television story on bats. Bats found included 46 *Myotis lucifugus*, 104 *Myotis septentrionalis*, 24 *Pipistrellus subflavus*, and 25 unidentified *Myotis*, for a total of 199 bats. Some evidence of vandalism was noted, including dead bats and various items of trash. However, the last check of the Macia Mine (3/25/86) noted comparable numbers of bats (224), indicating that the vandalism probably had little effect on bat numbers.

The Rowe Copper Mine was checked on April 2nd by Jim Cardoza, Tom French, Ellie Horwitz, and Tony Gola, accompanied by reports from the Boston Herald. A total of 864 bats were counted, including 578 *Myotis lucifugus*, 243 *Myotis septentrionalis*, 39 unidentified *Myotis*, and 4 *Eptesicus fuscus*. On the last check of this mine, on 4/10/85, a total of 791 bats were counted. The property on which this mine is found has recently been sold, and the future accessibility of the mine is in doubt. Preliminary contacts regarding the sale of the mine to the Division have not been followed up as yet.

On March 16th, Cardoza and R. Hogan (USFWS) accompanied Allan Hicks of the NY Bureau of Wildlife to the Barton Hill Mine in Essex County, NY. This mine supports several hundred Indiana Bats (*Myotis sodalis*) and small-footed bats (*M. leibii*) in addition to thousands of other Myotis. This mine is probably the nearest site to Massachusetts where the Indiana bat is known to occur.

Natural Heritage & Endangered Species Staff

Dr. Thomas W. French
Assistant Director, Natural Heritage

Bradford G. Blodget

William J. Davis

Annie Marlow

Dr. Scott Melvin

Joanne Michaud

Juliette Santos

Bruce Sorrie

Dr. Patricia Swain

Henry Woolsey

INFORMATION & EDUCATION

Ellie Horwitz
Chief, Information & Education

The Information and Education Section serves the public through numerous forms of outreach. To do this all staff members respond to a large number of mail and telephone inquiries, they offer programs through various sponsoring groups including scouts, civic groups, conservation organizations and sportsmen's clubs.

The Section maintains a steady flow of information to members of the media. The Section was greatly assisted in this during this year by the acquisition of a Macintosh Plus computer. During 1986 (press reports are maintained on a calendar year basis) the section issued 36 press packets containing 146 release items. These items were received by both print and electronic media. While it has not been possible to monitor the use of releases by the electronic media it has been found that Massachusetts newspapers printed an average of 326 stories or items per month which originated from Division press releases.

In addition to mailing out releases the Section called writers on particularly topical happenings and provided background information to media representatives working on feature pieces. In addition to responding to requests from writers, the Section hosted a number of special events designed to encourage media interest in wildlife. Among these were special events established for coverage of:

eagle arrival and release
beavers transported to Tokyo
Sheraton Game month press luncheon
Hawk migration
Deer season hotline
bat survey
turkey translocation

Annual Materials
As required by law the Section prepared and produced Abstracts of migratory bird hunting regulations for 1986 and Licenses and Abstracts of Fish and Wildlife laws and regulations for 1987. Because increasing amounts of material have been forced into the Abstracts it was determined that it was necessary to double the size of the Abstracts. In order to be able to afford this expansion under existing budgetary constraints the hunting and fishing licenses were redesigned to make printing of the licenses and permits less expensive. The new license form is actually more convenient in that it has all permit applications attached and that it has a duplicate slip which contains all the vital information, thus allowing sportsmen to obtain a duplicate from any license sales outlet. The Section also produced waterfowl stamps and archery/primitive firearms stamps.

Exhibits
As in the past the Division has taken part in numerous fairs and shows bringing a live animal display to the Eastern States Exposition, the Springfield Sportsmen's show, the Eastern Fishing and Outdoor Exposition (Worcester), the Greenfield Fair, and the Topsfield Fair. The Division also created photo displays for use at smaller fairs and one day events such as the New England Environmental Conference and the Annual Meeting of the Mass. Assn. of Conservation Commissions.

A special exhibition on Division activities was sponsored by the Shawmut Bank and placed in Shawmut's lobby for a four month period. Another special exhibit was designed and built at the Commonwealth Museum and focused on artwork by Louis Agassiz Fuertes.

Photography

With the Senior photographer fully involved in the eagle restoration project, the Section's junior photographer was confronted with the responsibility of handling a very large number of requests for photographs. Most of these requests came from the print outlets, Division staff members and the office of the Commissioner. To meet these needs the photographer spent extensive time in the field documenting Division projects and activities. Featured among these were restoration of Atlantic salmon, acid rain research, junior conservation camp, the black bear project, and land acquisition. In addition he photographed large numbers of charts and graphs for use in presentations by Division staff. Photos of exceptional quality were reserved for use in *Massachusetts Wildlife*.

A special effort was initiated to keep up with proof sheets and to begin to deal with the backlog of color slides which have not been catalogued during the past few years.

The "new" Massachusetts Wildlife features full color covers as well as color illustrations inside the magazine

Publications

This was an historic year for the Division's major publication, *Massachusetts Wildlife* , which, for the first time ever, was offered to the public on a subscription basis beginning with the summer issue of 1986. The magazine is now a 40 page quarterly with eight pages of color. During this first year of operations it was necessary to establish a budget and to design and develop an extensive promotional campaign and to obtain approval for subscription rates. Over the year the readership transformed from 10M free recipients to 14M paid subscribers. The transition required the Section to establish procedures to handle subscriptions and to deal with occasional nonstandard situations or occasional problems in the fulfillment of a subscription.

To meet the demands placed by the subscription system, Priscilla MacAdams was hired to assist in processing subscriptions as well as to deal with the ever increasing volume of incoming telephone calls requests and mail.

Numerous other small publications were also produced including:

- 2 WMA booklets
- sea run trout
- cub scout brochure
- conservation camp brochure
- pond map booklets
- lists of waters stocked with trout, northern pike or tiger muskies
- various natural history flyers were updated
- handouts for exhibits
- If You Care Leave Them There
- Homeowner's Guide to Bats in Massachusetts
- Whom to call when...

Uniforms

After much discussion it was determined that it was important that MDFW staff be recognizable as officials under field conditions. As a first step in this direction the Division purchased green caps with the Division's emblem sewn on.

Education

During this period the Division began planning and development for its implementation of Project WILD, an interdisciplinary program supplement for classrooms K - 12 which focuses on wildlife. In formulating an approach to the program, Coordinators Horwitz and Charles E. Roth, Mass. Audubon Society, set up a WILD steering committee. This committee reviewed implementation plans and set policy guidelines where needed. During this initial period considerable hostile publicity was distributed by groups in opposition to Project WILD. Response to the concerns of citizens unfamiliar with the program and aware only of the fear literature being distributed, took much of the coordinators' time By the end of the year the fears had abated and the volume of letters and inquiry had returned to normal. During the year the coordinators and facilitators conducted workshops training teachers and an additional group of facilitators. All persons who participated in WILD workshops subsequently received issues of a quarterly WILD newsletter.

During January the WILD facilitators held a special conclave to provide additional training in WILD and additional information about wildlife. The topic of this first conclave was "Bears of Massachusetts." In reaching out to the educational community the coordinators met with Barbara Krysiak, Deputy Director of the Department of Education, to apprise the Department about WILD and its availability and, in light of the controversy, to encourage the Department staff to examine the materials themselves. The materials have been enthusiastically received by the Dept. of Education which will utilize WILD in its seminar series.

In an attempt to bolster income for the program and to provide needed materials for small children, the coordinators created a coloring book, Massachusetts Wildlife, available for sale through the program.

Special Projects and Events

Employees Conference

The Section hosted a day long employees conference at the Marlboro Rod and Gun Club. Here staff members became familiar with new programs and were updated on existing ones.

Northeast Fish and Wildlife Conference

This year Massachusetts hosted the Northeast Fish and Wildlife Conference which draws registrants from 13 northeastern states and from the Canadian provinces. The conference was planned, organized and staffed by the staff of the Massachusetts Division of Fisheries and Wildlife. Information and Education Section staff were heavily involved with planning and arrangements for this conference and particularly with organizing the information/education segment of the program.

Tags 'n' Trout

This was the eighth year for this cooperative promotional program which encourages local civic groups and merchants to sponsor special fisheries in local waters. Eighteen sponsoring groups placed 466 "prize" fish in 21 bodies of water. Seventy percent of the tagged fish (326) were caught and the tags returned to the sponsors for awards.

Sportfishing Awards

This program, which provides information on the location of trophy fish in Massachusetts, operates on a calendar year basis. During 1986, 673 pins were awarded to anglers taking exceptional fish in any of 19 categories (no affidavits were received for landlocked salmon.) This is the second highest number of awards issued in a single year and it included a new state and world record shad (11 lbs. 4 ozs) taken by Bob Thibodo of Northampton. Changes inaugurated this year include a new requirement that all weighing stations use only certified scales. A new program decal was designed, padded envelopes were obtained to minimize damage to the award pins during handling and the Section issued a flyer to assist weigh station staff in identifying bullheads and catfish.

Conservation Camp

The Section has continued to provide staff and expertise to the Massachusetts Junior Conservation camp. Section secretaries conducted pre-camp publicity, processed applications and provided all forms needed for campers. Information and Education Section staff provided instruction for the sessions on wildlife management and on aquatic systems.

Waterfowl Stamp Competition and Exhibit

An advisory group of individuals interested in the Massachusetts Waterfowl stamp competition met and intensively reviewed the regulations and procedures for the contest during the course of this year. As a result of these meetings, wording of the regulations was altered to permit decoys that were made by techniques other than carving. It also permitted artists more leeway in the presentation of the decoy and admitted the possibility of more than one decoy. It also clarified specifications for size and presentation of submissions. The revised regulations also require the artist to make a minimum of 400 prints of the winning painting. The groups also reviewed the financial status of the program. Based on an analysis of costs incurred in the waterfowl stamp program the group recommended that the Division consider raising the price of the stamp to $3.25 or even $5.25.

The contest itself was held in early September of 1987. Twenty five artists from eleven states submitted 41 designs to the stamp competition held in September of 1986. A panel of judges deliberated for much of the morning before selecting a painting of a Joe Lincoln wigeon drake submitted by Peter Baedita of Peabody, MA.

Judges examine the entries in the waterfowl stamp art contest

Calendar

The Section Chief explored possibilities for publishing a wildlife calendar. This process involved obtaining information from other states which have such calendars, studying a variety of options for productionand distribution, and investigating a series of funding options.

Information and Education Staff

Ellie Horwitz, Chief

William Byrne

Debbie D'Angelo

Priscilla MacAdams

Peter Mirick

Jack Swedberg

DISTRICT REPORTS

Northeast District, Walter Hoyt, District Wildlife Manager
Southeast District, Louis Hambly, District Wildlife Manager
Central District, Chris Thurlow, District Wildlife Manager
Connecticut Valley District, Herman Covey, District Wildlife Manager
Western District, Tom Keefe, District Wildlife Manager

The five wildlife districts form the field presence of the Division of Fisheries and Wildlife administering wildlife lands, conducting on-site management activities and dealing with wildlife issues pertinent to their region.

Staff from the districts implement fisheries and wildlife research projects, conduct trout and pheasant release programs, operate deer, bear, turkey and furbearer checking stations, and serve as liaison with sporting and conservation groups in their areas. All districts distribute licenses, abstracts and other materials related to hunting/ fishing license sales and assist officers from the Division of Environmental Law Enforcement in ensuring public adherence to wildlife laws and regulations.

During this past year, District staff participated in a wide variety of research projects including the mid-winter eagle survey, waterfowl inventory and banding, census of mourning doves, woodcock, quail, and survey of great blue heron rookeries. They also monitored the pH levels of lakes and streams prior to stocking trout in those waters.

District staff reviewed the Environmental Monitor for development projects that affect wetland areas and provide technical advice on the control of environmental problems and on the handling of nuisance animal problems. District managers represented the Division at a wide variety of civic and sportsmen's group gatherings.

In addition to the activities common to all districts there were certain activities that occupied staff of only one or two districts. In this regard the staff of the Northeast District managed controlled hunts on the Martin Burns Wildlife Management Areas. Staff from the Southeast District were involved in a cooperative liming program with Living Lakes Inc. to mitigate the effects of acidification.

The Southeast staff continued their efforts to enhance reproduction of walleyes at Assawompsett Pond by trapping and spawning fish and maintaining the eggs. While the eggs developed and eyed out well, the eggs were ultimately lost as a result of storm induced mechanical failure.

Central District staff assisted with renovations to the eagle hacking tower at Quabbin Reservation and initiated a database for the state's pheasant program.

The Connecticut Valley staff was augmented, this year, by reassigned staff from the recently clsed Wilbraham Game Farm. This additional workforce allowed the District to expand their efforts in cutting and improving woodlands for wildlife habitat. Much of this took place in an area being cleared in preparation for the expansion of the Sunderland Fish Hatchery. They also constructed a livewell cage for use in the eagle restoration project and six holding cages for Plymouth red-bellied turtles. This District has been heavily involved in assisting with transport of Atlantic in assisting with transport of Atlantic Salmon in the restoration project which now includes tributaries of the Deerfield, Bear and South Rivers. Staff members also worked closely with teams of volunteers from Trout Unlimited, Western Mass. Fly Fishermen and the Worcester Chapter of New England Fly Fishermen to improve and enhance conditions for trout in the section of the Swift River between Winsor Dam and Route 9.

Staff from the Western District participated in the live trapping and eastward relocation of wild turkeys during the winter months. Spring and summer seasons found this District's staff heavily involved with signing areas, preparatio of cooperative farming agreements and making basic arrangements for acquisition of additional open lands for wildlife.

DISTRICT STAFF

Northeast District

Walter Hoyt, Manager
Tom Sheehan, Game Manager
Peter Jackson, Fisheries Manager
Dave Ford
Russell Garland
Lawrence Howie
Howard Krieser
Frank O'Meara
Roscoe Perham III
Gary Zima

Southeast District

Louis S. Hambly, Jr. Manager
Richard Turner, Game Manager
John Dixon, Fisheries Manager
Barbara Brockman
Joseph Comick
Ed Kraus
Peter Nelson
Richard Norton

Central District

Chris Thurlow, Manager
Michael Ciborowski, Game Manager
Lee McLaughlin, Fisheries Manager
Dave Carlson
Cheyney Dodge
John Hazard
Paul LeBoeuf
Arthur Myers
Paul Orrizzi
Paul Ostrowski
Robert Thomasian

Connecticut Valley District

Herman Covey, Manager
Peter Pekkala, Game Manager
Philip Brenner, Fisheries Manager
Daniel Bielecki
Michael Dumont
Andrew Foley Jr.
Gary Galas
John Nowakowski Jr.
Nelson Pratt
Martin Wrubel

Western District

Tom Keefe, Manager
Anthony Gola, GameManager
Leo Daly, Fisheries Manager
Edgar Hover
Joseph Kirvin
David St. James
Jerry Shampang

REALTY

Floyd Richardson
Chief, Wildlife Lands

1987 was a most active and interesting year for the Realty Section. It was the first year to show the full impact of the Chapter 723, Acts of 1983, bond fund monies for open space land acquisition. Through this program the Division of Fisheries and Wildlife completed 34 acquisitions for a total acquired acreage of 3335.7, far surpassing any other individual yearly effort in the present decade. Valuable lands were added throughout the Commonwealth, particularly in the Western District where 14 acquisitions accounted for over 2,000 acres.

It was a year of increased acquisition efforts aimed at broadening the Division's land information network. Consultant land agent candidates were interviewed for positions as the land District personnel spent time locating, setting priorities for purchase and negotiating for acquisition by the Commonwealth. The program established high priority particularly for the acquisition of connecting links between wildlife lands and riparian corridors. By the end of the fiscal year, 3335.7 acres were acquired bringing the total area owned by Fisheries and Wildlife to 52,550.78 acres.

Perhaps this accomplishment was most befitting to the retirement of Floyd Richardson, Chief of Wildlife Lands who retired on June 30, 1987 after a long successful career with the Division of Fisheries and Wildlife.

The Western District added 2002 acres in 14 separate acquisitions. Additions to six different Wildlife Management Areas greatly increased the biological value and recreational potential of the subject areas. A new wildlife management area, the Hop Brook WMA, was introduced this fiscal year, with two acquisitions totalling over 280 acres. Hop Brook is a rich wildlife resource flowing from the Tyringham Valley to the Housatonic River in Lee.

The Valley District acquired the nucleus of a new management area known as Satan's Kingdom which will undoubtedly be a "red hot" management area in the future. Lying in the Towns of Northfield and Bernardston, this rugged area will hopefully become one of the Division's largest WMA's. Three stream access sites along the Westfield River were also acquired, facilitating trout stocking and ensuring public recreation opportunities.

The Central District acquired 726 acres through six new acquisitions. The new Richardson WMA in Brookfield and West Brookfield was purchased, placing 327 acres of diverse wildlife habitat under Fisheries and Wildlife control. Only Route 9 separates this valuable resource from the Division's 1100+ acre Quaboag WMA. Adjacent properties to the Moose Hill, Millers River and Birch Hill WMA's were also placed on record. A 247 acre acquisition along Lawrence Brook in the Town of Royalston may well be the beginning of a future management area.

The Northeast District acquired five tracts including lands adjacent to the Downfall WMA, the Nashua River and a 120 acre tract providing additional protection to Elbow Meadow. The headwaters of Trapfall Brook, a rich native trout stream, were afforded protection through a 22.5 acre purchase in Ashby. A joint acquisition with DEM placed a 212 acre parcel on the Squannacook River in public ownership.

The Southeast District protected three parcels of land along the Mashpee River, further enhancing the wildlife and recreational value of this riparian corridor. The addition of Hockomock Swamp inholding brings Fisheries and Wildlife ownership of this wetland resource to nearly 4,850 acres.

Backwater ponds and marshes enhance the Charles River floodplain for wildlife.

Realty Staff

Floyd Richardson, *Chief*

William J. Minior, *Right of Way Negotiator*

FEDERAL AID PROGRAM

R. Stewart McCaig
Federal Aid Coordinator

In 1987, the state received apportionments amounting to $700,500 through the Pittman-Robertson Program and $1,400,000 through the Dingell-Johnson Program. The Pittman-Robertson Act, as amended in 1974, allows the state to use $375,000 of these funds for hunter safety training; this amount represents 1/2 of the excise tax revenues from the sale of pistols, revolvers, bows and arrows. The balance of Pittman-Robertson funds not used for the hunter safety program may be applied to costs of wildlife management.

The 1987 Pittman-Robertson apportionment remained in the same range as in recent years. However, the Dingell-Johnson apportionment reflected a substantial increase in revenue traceable to the Wallop-Breaux (1984) amendment. The effect of the 1984 legislation first appeared in 1986 when the Massachusetts apportionment rose from a pre-Wallop-Breaux level of $350,600 in 1985 to $1,100,000 in 1986. In 1987 the apportionment continued to rise and reached $1,400,000. New funding sources that are responsible for this augmentation of fisheries program income are excise taxes on additional items of fishing gear, duties on imported fishing tackle and watercraft, a share of motorboat federal fuel taxes, and interest that accrues to the Sport Fish Restoration Fund, one of two federal accounts established by the Wallop-Breaux Act.

Not all of the 1987 apportionment was available to the Division of Fisheries and Wildlife. According to regulations implementing the Wallop-Breaux Act, an "equitable" share, determined to be 36%, was allocated to the Massachusetts Division of Marine Fisheries, following terms of a Memorandum of Understanding between the two fisheries agencies. Other features of the Wallop-Breaux amendment that the Division must now consider are the required use of 10% for boating access and the allowable use of up to 10% for aquatic resources education. Both of these subjects are now included in the Massachusetts fisheries program.

Two other sources of federal assistance used by the Division during 1987 were the Anadromous Fish Act and the Endangered Species Act. Federal funds made available from these sources were, however, of relatively minor significance.

As of the beginning of Fiscal Year 1987, the Division had encumbered its federal funds in the amount $1,561,770 in nine active Pittman-Robertson Projects, $527,475 in nine active Dingell-Johnson projects, $20,000 in an anadromous fish project, and $27,200 in an endangered species project.

LEGISLATION

Acts of 1986

Chapter 159 - An Act Prohibiting the Counterfeiting of Tags and Seals Issued by the Division of Fisheries and Wildlife.

Chapter 160 - An Act Regulating the Transportation of Certain Reptiles and Amphibians for Commercial Purposes.

PERSONNEL REPORT

Appointments

James Hahn, Fish Culturist, 7/22/86
Ralph Taylor, Fish Culturist, 7/22/86
Albert Leach, Laborer, 9/29/86
Kristen Carter, Junior Clerk Typist, 9/29/86
Marcia Hartleb, Junior Clerk Typist, 9/29/86
Barbara Brockman, Laborer, 10/30/86
Francis Ibili, Senior Bookkeeper, 12/30/86
Mark Tisa, Asst. Aquatic Biologist, 1/27/87
Paul LeBoeuf, Laborer, 2/26/87

Retirements

Eight staff members retired from the Division of Fisheries and Wildlife taking with them a total of 215 years of experience. They are:

Walter Dauderis, Asst. Game Culturist, 7/86	23 years
Earl Labonte, Skilled Laborer, 9/86	10 years
Carl Zobka, Asst. Fish Culturist, 4/87	28 years
Paul Ostrowski, Skilled Laborer, 7/87	36 years
Harlan Buckmaster, Skilled Laborer, 7/87	32 years
Edgar Hover, Fish & Game Mgmt. Specialist, 7/87	33 years
Floyd Richardson, Chief of Wildlife Lands, 7/87	36 years
Cheryl Richardson, Confidential Secretary, 7/87	17 years

Resignations

Mary LaFleur, Junior Clerk Typist, 7/3/86
Ellen Cocaine, Junior Clerk Typist, 7/3/86
Daniel Bielecki, Laborer, 8/22/86
Maria Marenghi, Senior Bookkeeper, 8/15/86
John Hazzard, Laborer, 12/30/86
Kathleen McDonald, Administrative Asst., 2/26/87
Dwight Galler, Nongame Fund Manager, 7/87

Promotions

Stephanie Shea To: Asst. Game Culturist, 8/28/86
Stephen Henry To: Senior Land Use Planner, 9/29/86
Howard Kreiser To: Skilled Laborer, 12/30/86
Richard Donahue To: Skilled Laborer, 1/27/87

Financial Staff

Nancy Melito
Head Administrative Assistant

Nancy Limosani
Maria Marenghi
Marcia Plourde
Marylou Raples
Elizabeth Sienczyk
Ruthann Surette

FINANCIAL REPORT

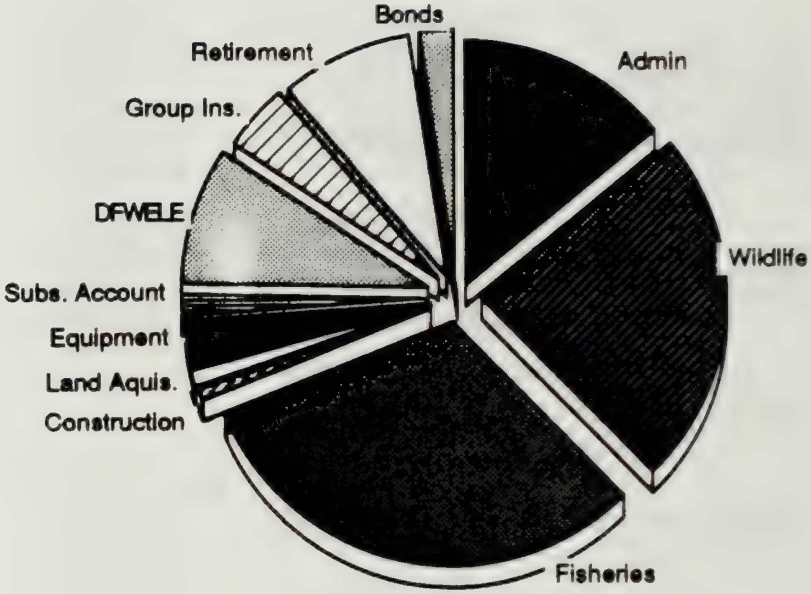
Nancy Melito

Head Administrative Assistant

Appropriations and Expenditures
Inland Fish and Game Accounts

Account No.		Appropriations	Expenditures & Liabilities	Total Reversions
2310-0200	Administration	$898,632.00	$894,226.73	$4,405.27
2310-0311	Mass. Wildlife Mag.	$72,671.40	$72,670.54	$0.86
2310-0315	Purchase of Equipment	$200,000.00	$196,594.59	$3,405.41
2310-0400	Wildlife Management	$3,494,776.00	$3,440,848.68	$53,927.32
		$4,666,079.40	$4,604,340.54	$61,738.86
		Continuing Appropriations	Expenditures	Balance Forward
2310-0300	Dev. & Imp. or Facilities	$120,761.81	$60,749.60	$60,012.21
2310-0310*	Acq. of Upland Areas	$347,552.71	$76,376.20	$271,176.51
		$468,314.52	$137,125.80	$331,188.72
		Capital Outlay Appropriation		
2670-9016	Coastal & Inland Acq.	$3,940.99	—	$3,940.99
	General Fund Accounts			
		Appropriations	Exp. & Liabilities	Total Reversions
2310-0500	Nat. Heritage, Greenways	$211,041.00	$205,738.71	$5,302.29
2310-0550	Acid Rain Program	$399,425.00	$372,569.57	$26,855.43
		$610,466.00	$578,308.28	$32,157.72
		Continuing Appropriations	Expenditures	Balance Forward
2310-0310*	Acq. of Upland Areas	$115,850.90	$25,458.73	$90,392.17
2310-0551	Acid Rain Research	$59,059.00	$18,022.57	$41,036.43
		$174,909.90	$43,481.30	$131,428.60
		Capital Outlay Appropriations	Expenditures	Balance Forward
2310-8821	Wastewater Treatm. Facility	$179,821.00	$3,409.10	$176,411.90
2310-8840	Acq. of ColdWater Streams	$3,760,000.00	$232,650.29	$3,527,349.71
2310-8841	Associated Costs	$240,000.00	$15,317.09	$224,682.91
2310-8842	Acq. of Adjacent Lands	$7,050,000.00	$1,223,968.46	$5,826,031.54
2310-8843	Associated Costs	$446,218.25	$24,871.38	$421,346.87
		$11,676,039.25	$1,500,216.32	$10,175,822.93
		Retained Revenue Total Available	Expenditures	Balance Forward
2310-0312	Mass. Wildlife Mag.	$121,149.44	$21,350.37	$99,799.07
	Nongame Wildlife Fund Account			
		Appropriation	Exp. & Liabilities	Total Reversions
2315-0100	Nongame Program	$299,367.00	$248,333.19	$51,033.81
	Trust Fund Accounts			
		Total Available	Expenditures	Balance Forward
2310-6005	Bald Eagle Trust I	$6,268.81	$5,787.53	$473.28
2310-6006	Bald Eagle Trust II	$2,000.00	—	$2,000.00
		$8,260.81	$5,787.53	$2,473.28

* 75% Inland Fish and Game Fund; 25% General Fund



	percent
Administration	14.28
Wildlife	23.70
Fisheries	31.25
Construction	.97
Land Aquisition	1.22
Equipment	3.13
Subs. Account	1.50
DFWELE	9.27
Group Insurance	4.58
Retirement	8.61
Bonds	1.49

HOW THE SPORTMEN'S DOLLAR WAS SPENT

Administration	Account No.	Expenditures		Percentage
Administration	2310-0200	$592,748.68		
Information	2310-0200	$301,478.05	$894,226.73	14.28%
Wildlife Programs				
Game Farms	2310-0400	$424,555.50		
Wildlife Mgmt.*	2310-0400	$969,034.12		
Wildlife Coop. Unit	2310-0400	$90,500.00	$1,484,089.62	23.70%
Fisheries Program				
Fish Hatcheries	2310-0400	$1,039,156.70		
Fisheries Mgmt.*	2310-0400	$830,602.30		
Fisheries Coop. Unit	2310-0400	$87,000.00	$1,956,759.00	31.25%
Construction				
Develop. & Improvement Facilities for Public Use*	2310-0300		$60,749.60	0.97%
Land Acquisition				
Acq. of Upland Areas & Inholding on Existing Areas* **	2310-0310		$76,376.20	1.22%
Equipment				
Purchase of Equipment	2310-0315		$196,594.59	3.13%
Subscription Accts.				
Mass. Wildlife Mag.	2310-0311	$72,670.54		
Mag. (Retained Revenue)	2310-0312	$21,350.37	$94,020.91	1.50%
DFWELE				
Env. Law Enforc. Officers' Salaries & Exp. (7.5%)	2350-0100			
Hunter Safety Training***	2350-0101		$580,200.00	9.27%
Transfers from Fund				
Group Insurance	1590-1007		$286,000.00	4.58%
Retirement Assessment	0612-1000		$539,000.00	8.61%
Int. on Bonded Debt	0699-2800		$13,000.00	0.21%
Mat. Serial Bonds & Notes	0699-2900		$80,000.00	1.28%
TOTAL EXPENDITURES			$6,261,016.65	100.00%

* Continuing Appropriation

** Portions of expenditures up to 75% reimbursable by Federal Government

*** 100% reimbursable by Federal Government

REVENUE,OTHER FINANCING SOURCES,REVERSIONS
INLAND FISH & GAME FUND

Collected by Agency	Receipt Acct.#	Amount
Fish., Hunting & Trap. Lic. *	3304-61-01-40	$3,378,636.50
Archery Stamps*	3304-61-01-40	$118,144.30
Trap Registrations	3304-61-01-40	$1,432.00
Waterfowl Stamps*	3304-40-01-40	$11,975.65
Waterfowls Stamps-Ducks Unlimited*	3304-40-01-40	$21,908.80
Special Licenses, Tags & Posters**		$16,693.45
Antlerless Deer Permits	3304-61-14-40	$45,315.00
Bear Permits	3304-61-14-40	$6,180.00
Turkey Permits	3304-61-14-40	$37,420.00
Rents	3304-63-01-40	$21,963.60
Sales, Other	3304-64-99-40	$4,273.10
Refunds Prior Year	3304-69-01-40	$2,326.15
Misc. Income	3304-69-99-40	$77,445.35
Magazine Subscriptions	3304-40-09-36	$93,317.90
		$3,837,031.80
Collected by State Treasurer		
Fines and Penalties	3308-41-01-40	$39,007.53
Interest & Disc. on Revenue	3395-60-01-40	$41,188.92
		$80,196.45
Federal Aid Reimbursement		
Pittman-Robertson	3304-67-01-40	$1,042,588.86
Dingell-Johnson	3304-67-02-40	$327,080.15
Anadromous Fish Projects	3304-67-04-40	$20,595.49
Endangered Species	3304-67-11-40	$10,577.91
Indirect Cost Reimbursement	3304-67-67-40	$519,607.15
		$1,920,449.56
Taxes		
Gasoline Tax Apportionment	3312-05-01-40	$401,737.67
TOTAL REVENUE:		$6,239,415.53
Transfers from General Fund		
Reimbursements on Half-Price Lic.	3360-95-08-40	$70,000.00
Reversions		
Accounts Payable		($215,000.00)
TOTL. OTHER FINANCING SOURCES		($145,000.00)
TOTAL REVENUES & OTHER SOURCES		$6,094,415.53
SURPLUS AS OF JUNE 30, 1987: Inland Fish and Game Fund		$1,150,000.00
SURPLUS AS OF JUNE 30, 1987: Nongame Wildlife Fund		$630,000.00

* Detail Sheet #1

** Detail Sheet #2

Detail Sheet #1

RECEIPTS FROM FISHING,

Class	Type of License	Unit Price	Quantity
F1	Res. Cit. Fishing	$12.50	120,334
F2	Res. Cit. Minor Fishing	$6.50	6,157
F3	Res. Cit. Fish. (65-69)	$6.25	4,890
F4	Res. Cit. Fish. (Blind-Para.)	FREE	1,137
F5	Res. Alien Fishing	$14.50	1,339
F6	Non-Res./Alien Fish. Cit.	$17.50	5,856
F7	Non-Res./Alien Fish. (7 day)	$11.50	2,430
T1	Res. Cit. Trapping	$20.50	728
T2	Res. Cit. Minor Trapping	$8.50	74
T3	Res. Cit. Trapping (65-69)	$10.25	49
T4	Non-Res. Trapping	$300.00	1
DF	Duplicate Fishing	$2.00	272
DT	Duplicate Trapping	$2.00	3
H1	Res. Cit. Hunting	$12.50	43,102
H2	Res. Cit. Hunting (65-69)	$6.25	652
H3	Res. Cit. Hunting (Para.)	FREE	149
H4	Res. Alien Hunting	$19.50	1,015
H5	Non-Res.Cit./Alien Big Game	$48.50	1,503
H6	Non-Res. Cit./Alien Small Game	$23.50	1,258
H7	Non-res. Cit./Alien Comm.Sh. Pres. -3 day	$19.50	104
S1	Res. Cit. Sporting	$19.50	51,836
S2	Res. Cit. Sporting (65-69)	$9.75	2,549
S3	Res. Cit Sporting (Over 70)	FREE	16,338
DH	Duplicate Hunting	$2.00	16
DS	Duplicate Sporting	$2.00	226
12	Duplicates(not class.-old series)	$2.00	3,023
	Total License Sales		265,041
M1	Archery/Primitive Firearms Stamps	$5.10	23,497
	Trap Registrations*		
	Net Adjust.(Bad checks, etc.)		
	Agency Total**		288,538
M2	Waterfowl Stamps***		31,277
			319,815

*** Trap Registrations: 67 initials @ $4; total $268.00. 388 renewals @ $3; total $1,164.00**

****State Treasurer's Total: $3,377,966.80 ($115,154 less)
Inadvertently $8,702.00 was deposited in receipt account 3304-40-01-40 and $116.00 in 3304-40-02 (Waterfowl Stamp accts.); $27,788.00 in 3304-61-04-40 (Propagators); $64,101.50 in 3304-61-10-40 (Comm. Shooting Pres.) and $14,446.50 in 3304-61-14-40 (Antlerless deer, bear & turkey permits**

HUNTING & TRAPPING LICENSES

Gross Amount	Fees Retained by Clerks	Net Returned to State
$1,504,175.00	$32,115.50	$1,472,059.50
$40,020.50	$2,310.50	$37,710.00
$30,562.50	$2,213.50	$28,349.00
$19,415.50	$440.00	$18,975.50
$102,480.00	$1,802.00	$100,678.00
$27,945.00	$675.50	$27,269.50
$14,924.00	$293.00	$14,631.00
$629.00	$35.00	$594.00
$502.25	$20.50	$481.75
$300.00	-	$300.00
$544.00	-	$544.00
$6.00	-	$6.00
$538,775.00	$14,225.00	$524,550.00
$4,075.00	$292.50	$3,782.50
$19,792.50	$405.50	$19,387.00
$72,895.50	$539.00	$72,356.50
$29,563.00	$478.50	$29,084.50
$2,028.00	$42.50	$1,985.50
$1,010,802.00	$15,177.00	$995,625.00
$24,852.75	$1,115.50	$23,737.25
$32.00	-	$32.00
$452.00	-	$452.00
$6,046.00	-	$6,046.00
$3,450,817.50	$72,181.00	$3,378,636.50
$119,834.70	$1,690.40	$118,144.30
$1,432.00		$1,432.00
($5,092.00)		($5,092.00)
$3,566,992.20	$73,871.40	$3,493,120.80
$39,096.25	$5,211.80	$33,884.45
$3,606,088.45	$79,083.20	$3,527,005.25

***State Treasurer's Total $42,702.45; ($8,818.00 more); as per previous note of $8,702.00+ $116.00 should have been deposited into receipt acct. 3304-61-01-40 (Licenses).

Detail Sheet #2

SPECIAL LICENSES,TAGS AND POSTERS

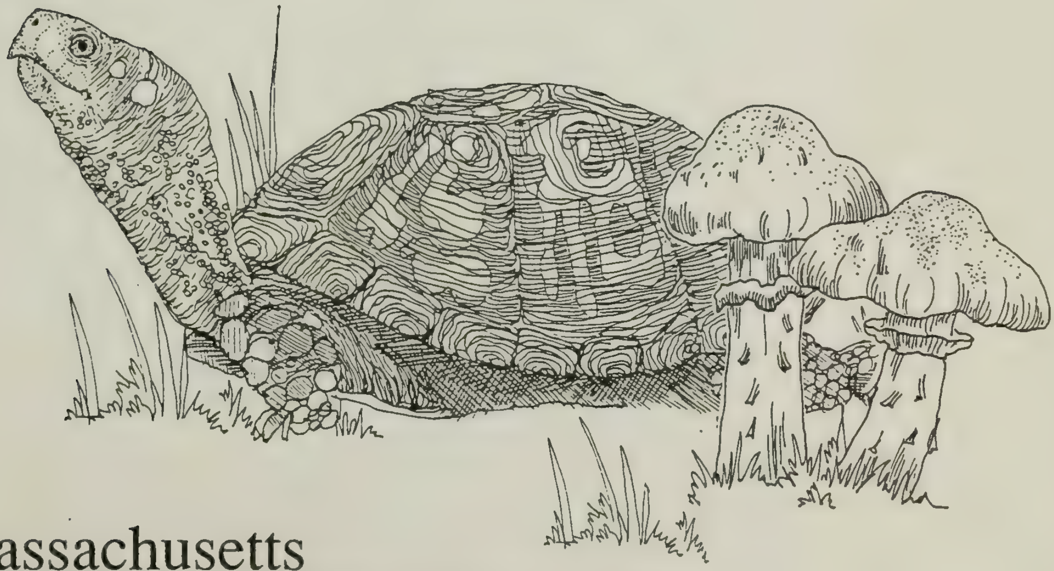
Receipt Account	Type of License	Quantity	Unit Price	Amount	Receipt Amount Total
3304-61-02-40	Fur Buyers Res.	21	$25.00	$525.00	
	Non-Res. or Aliens	9	$75.00	$675.00	$1,200.00
3304-61-03-40	Taxidermists	98	$20.00	$1,960.00	$1,960.00
3304-61-04-40	Propagators				
	Special Permits	181	$1.00	$181.00	
	Class 1 - fish				
	Initials:	19	$15.00	$285.00	
	Renewals:	146	$10.00	$1,460.00	
	Class 3 - fish				
	Initials:	24	$15.00	$360.00	
	Renewals:	87	$10.00	$870.00	
	Class 4-birds, etc.				
	Initials:	29	$15.00	$435.00	
	Renewals:	335	$10.00	$3,350.00	
	Class 6-dealers				
	Initials:	13	$15.00	$195.00	
	Renewals:	13	$10.00	$130.00	
	Addt'l. Stores	64	$5.00	$320.00	
	Class 7-Indv.				
	Initials:	2	$5.00	$10.00	
	Renewals:	10	$2.00	$20.00	
	Import. Permits				
	Fish	8	$7.50	$60.00	
	Birds	99	$7.50	$742.50	
	Class 9-Falconry				
	Masters:	9	$25.00	$225.00	
	Apprentices:	13	$25.00	$325.00	
	General:	18	$25.00	$450.00	
	Class 10-Falconry				
	Raptor Breeding	6	$10.00	$60.00	
	Class 11-Falconry				
	Raptor Salvage:	32	$1.00	$32.00	$9,510.50 *
3304-61-05-40	Take Shiners	82	$10.00	$820.00	$820.00
3304-61-06-40	Field Trial Lic.,	30	$15.00	$450.00	
		1	$10.00	$10.00	$460.00
3304-61-07-40	Taking of eels	4	$25.00		$100.00
3304-61-08-40	Quail for Dogs				
	Initials:	4	$7.50	$30.00	
	Renewals:	6	$5.00	$30.00	$60.00
3304-61-10-40	Comm. Shoot. Pres.	9	$50.00	$450.00	$450.00 *
3304-61-12-40	Mounting Permits	5	$2.00	$10.00	$10.00
3304-61-13-40	Spec. Field Perm.	16	$15.00	$240.00	$240.00
3304-64-01-40	Tags and Posters				
	Game Tags & Posters	8827	$10.00	$882.70	
	Fish Tags	20005	$0.05	$1,000.25	$1,882.95
					$16,693.45

* An additional $27,788.00 was inadvertently deposited in receipt acct. #3304-61-04-40 (Propagators) and $ 64,101.50 in receipt acct. #3304-61-10-40(Comm. Shooting Pres.); these receipts should have been deposited in acct.#3304-61-01-40

Annual Report

1988

State Library of Massachusetts
State House, Boston



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Fisheries & Wildlife**

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THE BOARD REPORTS

George Darey
Chairman

The Massachusetts Fisheries and Wildlife Board is a group of seven persons, selected on a regional basis for their demonstrated interest in wildlife. Two members represent specific areas of expertise: wildlife biology and nongame wildlife. Each member is appointed by the Governor to a five year term. The Board oversees operations of the Division of Fisheries and Wildlife, reviews programs and sets policy and regulations pertinent to wildlife in the Commonwealth.

During this fiscal year the Board continued to hold monthly meetings at locations around the state, hold public hearings on proposed regulatory changes and address issues of specific concern. Three issues which raised particular concern among Board members were the need for a standard procedure to respond to fishkills, the growing amount of posted land in the state and the resultant impact on wildlife management, and the need for followup on the unauthorized introduction of grass carp to Massachusetts

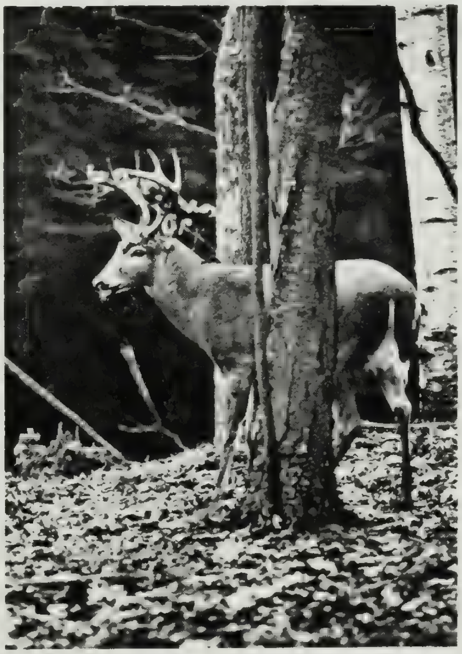
While these specific issues raised particular concern, most of the Board's time was spent in scrutiny and review of Division programs and proposals for regulatory changes. Among the items examined were:

Pheasant Rearing Program — In view of rising feed costs and projections of program costs increasing by $25,000 - $50,000 each year, the Board conducted a full review of game farm operations in the Commonwealth. A variety of options was considered in an effort to contain rising costs of the propagation program. Concluding their deliberations, the Board members voted to close the game farm at Sandwich on an experimental basis.

Deer Management — The Board reviewed the existing deer season regulations and considered certain proposals which had been submitted to them including:

- allowing the use of rifled caplocks during the primitive firearms season (rejected)
- allowing the use of antlers as calls (accepted)
- changing opening day of the shotgun season (rejected)
- changing the bag limit to two deer in zones 12, 13 and 14 (accepted)
- prohibiting the use of permanent tree stands except with the written consent of the landowner (accepted).

The Board also considered and approved the number of antlerless



Biological check station data indicates that despite increasing deer herd size, both deer and range are in good condition.

deer permits to be issued for the 1988 hunting season.

Bear Management — The Board reviewed the situation of black bears in the Commonwealth with special attention to complaints received about depredation by bears. As a result of these deliberations, it was determined that the two-part bear season, initiated in 1982, be continued without change until after the 1988 bear hunting season.

A radio-collared black bear is monitored by staff of the U. Mass. Coop. Wildlife Research Unit.

Fuertes Prints — The Board heard and approved a fee structure and a proposed marketing plan for the sale of art prints by Louis Agassiz Fuertes.

Species for Special Consideration— Acting on the recommendation of the Nongame Advisory Committee, the Board reviewed the state list of Species for Special Consideration and added to it the blue whale and the longnosed sucker. At the same time they upgraded the roseate tern from state threatened to endangered to conform to the current federal listing.

Non-Toxic Shot — The Board reviewed information pertinent to mandating a transition from the use of lead shot to the use of non-toxic shot for the hunting of waterfowl. Federal guidelines require that this transition be made statewide no later than 1991. After review of the information available, the Board voted to require non-toxic shot in Barnstable, Essex, Nantucket and Plymouth counties for the 1987 hunting season, and to require the use of non-toxic shot statewide for the 1988 hunting season.

Personnel actions — As overseer of the operations of the Division of Fisheries and Wildlife, the Board votes confirmation of hirings, promotions, retirements and other personnel actions within the Division. During the year they presided over 25 new hires, 10 promotions and 10 retirements. Noteworthy during this fiscal year was the hiring of Jack Buckley, former Fisheries Chief of Washington D.C., as Deputy Director of Administration .

Other Activities — In the course of reviewing Division projects and programs the Board addressed numerous other issues including a review of the Division's trout production program, a review of the status of *Massachusetts Wildlife*, and a review of the North American Waterfowl Management Plan. Board members George Darey and Dr. Gwilym Jones also gave extensively of their time and energies to the Special Commission on Environmental Operations, formed as a result of the *Agenda '90, Environmental Challenge Report.*

Massachusetts Fisheries and Wildlife Board

George L. Darey, Lenox, Chairman
Nancy Begin, Topsfield, Vice Chairman
John F. Creedon, Brockton, Secretary
Colton F. Bridges, Grafton
Dr. Gwilym S. Jones, Framingham
Michael P. Roche, Orange
Raymond W. Whitaker, Winchendon

FISHERIES

Peter H. Oatis
Assistant Director, Fisheries

Survey and Inventory

A total of 48 lakes and ponds were sampled to obtain baseline data on fish populations and evaluate the effects of previous management actions. Particular emphasis was placed on evaluating the density of smelt populations. Accurate density information will permit the development of refined brown trout stocking practices and/or regulatory recommendations that will optimize trout growth.

Crews sampled 103 streams to assess existing trout populations in order to determine the impact of channelization and acidification on these streams and to refine the development of the stream classification system.

First drafts of river guides for the Swift, Ipswich and North Rivers - as well as the upper and lower Connecticut River - were completed.

Acid Rain Investigations

This marked the fifth year of the Acid Rain Monitoring Project which is conducted by volunteers trained and managed by the Massachusetts Water Resources Research Center at the University of Massachusetts. By the end of the second year the program had successfully surveyed the entire state. The team is presently in the process of sampling 800 sites that represent the full gamut of acidified and buffered waters throughout the state. This monitoring will continue for at least the next ten years and will provide a basis for statistically valid analysis of the long term trends and rate at which Massachusetts' waters are acidifying. Since it's inception this project has demonstrated the Commonwealth's vulnerability (5.5% of Massachusetts' waters are acidified,16.7% are considered critical and 62% have very little buffering capacity). These data indicate that the recent national inventory of acidification assessment conducted by the Eastern Lakes Survey Team of the EPA grossly underestimated the threat of acidification to Massachusetts waters and may be invalid for other sections of the nation as well. Presently, information collected during the past five years is being loaded into the statewide graphic information system at the University of Massachusetts. The GIS will provide insight into long-term trends in surface water sensitivity, and the base maps produced will supply information for research and management decision making.

Whetstone Brook Project Another aspect of acid rain investigations is the Whetstone brook project, a joint federal/ state undertaking designed to evaluate strategies to mitigate the effects of acidification. The collection of two years of base line data relative to the physical, chemical and biological productivity of the brook is now complete. We are presently installing a hydropowered lime dispensing station at the head of the study section. The doser is expected to begin operation during the fall of 1988. Assessments of the impact of liming this historic but recently acidified troutstream will be conducted over the next three years.

Wallum Lake Liming Wallum Lake is a beautiful, deep, infertile and acid sensitive 322 acre lake in the Douglas State Forest. Situated on the Rhode Island border, it was first limed by Massachusetts in the winter of 1971 and again in 1982 by the state of Rhode Island. Continued acidification warranted additional liming in 1987. This liming was conducted cooperatively by the Massachusetts and Rhode Island Fish and Wildlife agencies, and funded by "Living Lakes," a private research organization. Detailed physical, chemical and biological monitoring both before and at least five years after liming is incorporated into the design of this investigation.

Cooperative Aquatic Research Program Aquatic research contracted by the Division to the Water Resources Research Center at the University of Massachusetts includes an investigation into the process of mercury methylation which, when it is concluded by late 1988, should provide insight into the processes in acidifying waters that stimulate the uptake of mercury through the food chain. Another investigation to be concluded late in 1988 is concerned with identifying the pathways that mobilize aluminum, a noted fish toxicant in acidified watersheds. The Division is assisting with research to determine ways in which alkalinity may be generated from within a lake itself. Lastly, the Division has completed preliminary risk assessment for the Hoosic, Housatonic, Westfield and Millers watersheds. Findings indicate the sections of river that could become toxic to fish if existing dischargers released effluents to the maximum degree allowed during a period when river flows are at 10 year annual low flow. Such information sheds light on potential problem areas. The second phase of the project will entail verifying the results of the model with actual measurements in the field. Information from these studies may lead to establishment of improved water quality regulations and to the re-evaluation of existing discharge permits issued by the Department of Environmental Quality Engineering.

Technical Assistance The amount of time and energy that fisheries staff members spent in providing technical advice and assistance to other agencies, review boards, advisory boards, special investigation teams and private concerns increased markedly during this year. Within the year activities included:

- monthly representation at the Pesticide Board
- representation on the Water Resource Interbasin Transfer Task Force
- participation in Hydropower Licensing Proceedings and Acid Rain Research Advisory Council meetings
- in-depth review of development and regulatory proposals encompassing projects such as pipeline crossings of streams
- lake diagnostic and feasibility study recommendations to the Division of Water Pollution Control
- commenting upon new regulations pertinent to water quality standards.

In addition, considerable field time was spent collecting specimens upon request from other agencies.

Anadromous Fish Restoration

Merrimack River Springtime fish passage operations at the Essex Dam began on May 9 and were completed on July 15, 1988. These operations successfully passed 12,359 American shad, 361,012 blueback herring and 65 Atlantic salmon. The shad figure represents a 27% decrease from the number passed during 1986. At this stage in the restoration effort it is too difficult to determine whether the low number is a reflection of a smaller shad population than in 1986 or the result of extremely low water levels coupled with mechanical problems on the fishway early in the season. Although the former reason may be suspected on the basis that blueback herring showed a five fold increase over the numbers passed the previous year, it must be remembered that it is not uncommon for shad/herring populations to fluctuate widely from year to year and that the peak of the blueback run occurs slightly later than that of the shad.

There were mechanical difficulties at the Lowell Fishway which successfully passed 1,289 or 32% of the 3,926 shad passed in 1987. Passage of blueback herring (56,739) was a record for the species at that barrier. Consolidated Hydro, the owners of the Essex and Pawtucket fishways, will initiate studies that will lead to more effective passage of downstream migrants.

Connecticut River A total of 294,157 American shad, 343,363 blueback herring, 15,912 sea lamprey, 256 striped bass and 74 Atlantic salmon were counted at the Holyoke fishway during the 1988 spring run. Unlike the situation at the first (Essex) fishway on the Merrimack River, shad passage at this first barrier on the Connecticut River showed an increase of more than 17,000 fish compared to 1987.

Upstream fish passage for shad at the Turners Falls Dam continues to be a major concern. Only 15,787 shad — 5% of the number lifted over the Holyoke dam — successfully migrate into the Turners Falls Pool. As with the facilities on the Merrimack, the development and installation of effective downstream passage facilities for juvenile shad and salmon is crucial to the success of the program. The completion and staffing of the new U.S. Fish and Wildlife Research Laboratory charged with investigating problems unique to riverine fish populations on the eastern seaboard will hasten the resolution of some of the passage problems.

Atlantic salmon smolts growing from fry released into coldwater tributaries throughout the basin will play an important role in restoring the species. The salmon smolt production potential for tributaries in the Westfield, Manhan and Deerfield drainages are currently being evaluated. Information from this investigation will be used to develop an integrated salmon fry stocking program within the Massachusetts portion of the Connecticut Basin.

Another achievement was obtaining the inclusion of cooling towers into the design of the Indek Electrical Co. co-generation facility to be situated on the Turners Falls Power Canal. These towers will assure that canal temperatures will be held within the tolerance of Atlantic salmon during both up- and downstream migration periods.

Atlantic Salmon smolts going into the Millers River.

Quabbin Investigations

Concern about elevated levels of mercury in lake trout prompted the issuance of a public health advisory cautioning anglers to limit their intake of lake trout. Despite the advisory issued in late August, the angling pressure does not appear to have decreased. Presently smelt, lake trout, smallmouth bass, white perch, salmon and white suckers from the reservoir are being screened for a variety of metals and organic compounds.

It appears that participation in the fishery is up slightly over the past two years. Approximately 46,700 anglers were accounted for at the boat liveries. A new state record for the lake trout was established here on May 4, 1988. Catches of lake trout, smallmouth bass and landlocked salmon were slightly higher than the previous year, while the white perch harvest increased from 7,000 to 14,000.

The threat of increased metal mobilization, particularly aluminum and nickel stemming from increased acidity, is a serious threat to the continued productivity of smelt and lake trout populations. Aluminum was mobilized during the early eighties and may have affected the survival of lake trout, lake trout eggs and fry. While the metal has not mobilized again within the past few years, additional events are expected. Because of concern over the effects of aluminum and nickel concentrations, the Division has begun to evaluate moving smelt eggs to hatching racks in the open reservoir.

Aquatic Resource Education

This new program, run primarily with volunteer effort, has continued to grow since it's inception in 1985. The goal of the program is to heighten public awareness of the importance of our aquatic resources. As a result of these efforts there are presently over three thousand people who have expressed an interest in participating in the program in one form or another. To address the demands for the program, the coordinator and volunteer staff trained and certified an additional 58 instructors during the past year. There are currently 128 certified instructors capable of instructing the public on a variety of aquatic issues. The strongest tool continues to be the hosting of one-day special fishing events. Over four thousand students participated in these events during the year. One hundred twenty-six students graduated from the four day intensive fishing clinics. The program newsletter "Shortcasts" is published and sent to all volunteer instructors on a bi-monthly basis. The highlight of the year was the first Aquatic Education Volunteer Appreciation Supper.

Fisheries Staff

Peter H. Oatis,
Assistant Director,for Fisheries

Joseph Bergin Jr.
William E. Easte
Dr. David Halliwell
Mary Hamlin
Richard Keller
John Lindenberg
Robert Madore
Dr. Mark Tisa
Gary Zima

HATCHERIES

David Fredenburgh
Chief, Fish Culturist

It was a good production year for the hatcheries, which raised and prepared for release a total of 904,700 trout, salmon, northern pike and tiger muskies at a total weight of 523,900 lbs. The stocked trout were of good quality as well as large size. Over 575,000 of the stocked trout fell into the category of nine inches plus.

The Sunderland Hatchery has been scheduled for re-construction. The design calls for 40 above ground fiberglass tanks with associated piping, valves and other necessary equipment. The hatchery will use only well water. To date, a new gravel-packed well has been constructed that yields about 500 gallons per minute. An effluent treatment facility will be constructed in the tailrace area.

A request for funding has also been made to upgrade the Sandwich facility. Major work would consist of re-building the concrete raceways, development of a partial water re-circulation system, building new hatch-house facilities and upgrading the grounds and facilities.

General maintenance was carried out at all of the facilities.
Specifically completed were:

- Rejuvenation and cleaning of a gravel-packed well at the McLaughlin hatchery
- Electrical work for the automatic pump shut off at the McLaughlin hatchery
- Installation of two 2 1/2" test wells at East Sandwich.

Additional maintenance at all of the hatcheries will be completed as money becomes available.

Trout Production 1987-88

Species	< 6	6 to 9	9 plus		12 plus	Total Fish Weight
McLaughlin						
Rainbow			24,000	157,800	181,800	198,960
Rainbow	(167,950)			(290)	168,240	2,660
Brook	30,000	2,500	103,560		136,060	52,910
Brook	(45,000)				45,000	335
Brown		94,150			94,150	23,840
Brown	(151,250)				151,250	5,325
TOTAL	30,000	96,650	127,560	157,800	412,010	275,710
(TR)	(364,200)				(364,200)	
Palmer					0	
Land. Sal.	50,000	61,750			111,750	15,365
Brood Sal.				345	345	865
Tiger Muskie		4,200	4,100		8,300	1,150
Rainbow			2,350		2,350	1,670
N. Pike			6,445		6,445	1,290
At. Salmon		29,400			29,400	4,200
TOTAL	50,000	95,170	12,895	345	158,410	24,540
Montague					0	
Rainbow			39,750	17,585	57,335	48,495
Brook			22,000	6,500	28,500	17,260
Brown		12,000		15,100	27,100	12,350
TOTAL		12,000	61,750	39,185	112,935	78,105
Sunderland					0	
Rainbow			46,100	11,910	58,010	52,400
Brook			15,300	5,620	20,920	17,245
Brown				19,470	19,470	19,475
TOTAL			61,400	37,000	98,400	89,120
Sandwich					0	
Rainbow			52,810		52,810	29,015
Brook		1,160			1,160	225
Sea-run Brown		14,100	725		14,825	3,735
Brown		30,225	23,945		54,170	23,460
TOTAL		45,485	77,480		122,965	56,435
GRAND TOT.	80,000	249,305	341,085	234,330	904,720	523,910
Transfers	364,200			290	364,490	8,320

Hatchery Staff

Bitzer Fish Hatchery
Ralph Taylor, *Manager*
Chester Kopinto
John Kopinto
John Williams

McLaughlin Fish Hatchery
James Hahn, *Manager*
Jennifer Ayre
Edward Bolduc
Annette Kucharczik
Albert Leach
John McGurn
William Mikelk
Roscoe Perham III
Joseph Skowron
John Sousa

Sandwich Fish Hatchery
Lloyd Raymond, *Manager*
Alan Aittaniemi
Antone Frenandes, Jr.
Lawrence Hollings
Arthur Leonard
Vernon Lopez
George Moore

Palmer Fish Hatchery
Michael Masley, *Manager*
Robert Lucas
Arthur Pellegri, Jr.

Sunderland Fish Hatchery
Frank Pietryka, *Manager*
John Besse, Jr.
John Gromaski
Douglas Isles
Edward Siwicki
Thomas Smith

WILDLIFE

Wayne F. MacCallum
Assistant Director, Wildlife Research

Birds

Game and Migratory Bird Censuses

Bobwhite Quail
The 1987 weighted call indices for Barnstable, Bristol and Plymouth counties, and the statewide total, showed no significant difference from 1985 mean indices or from a five-year (1977-85) mean index (all routes combined). The 1987 weighted index for Plymouth county did show a significant decrease from the five-year index for comparable routes.

Mourning Dove
Due to manpower limitations and the limited usefulness of dove survey information, the number of dove survey routes in Massachusetts was decreased from 18 in 1985 to eight in 1986 and subsequent years. The number of calling doves on three long-term routes increased 44 percent from 1987 to 1988. Counts on eight comparable routes increased 15 percent from 1987 to 1988.

Woodcock
The Fisheries and Wildlife Board continued the three bird daily limit on woodcock which has been in force since 1985. Although woodcock have made a good recovery, the census indicates that levels are still slightly below the long-term average.

The 1988 spring census of woodcock on 12 survey routes showed that the population was down slightly (-3.2%) from 1987. The spring was warm and dry through the peak of hatching and production was anticipated to be excellent. The breeding population index in the Eastern United States increased 2.3 percent.

Wild Turkey
The ninth Massachusetts spring gobbler hunt was held in May 1988. A total of 8,100 permits were allocated for each period of the season, of which 6,157 were received for the first period and 5,276 for the second period. Hunters provided a record kill of 557 turkeys with an overall success rate of 6.3%. The Berkshire county kill was 274 (49.2%) followed by Franklin county (125) and Hampshire county (59) Adult males comprised 270 (48.5%) of the kill.

Almost half of the 557 turkeys taken during the season were adult males or "toms".

Abundant snow cover facilitated winter trapping and Division staff succeeded in capturing 70 turkeys. Releases were made on the Phillips Sanctuary in Boxford (21, 9M:12F), Fall River-Freetown State Forest (24, 11M:13F) and near Baralock Hill in Groton (16, 5M:11F). An additional nine immature males were banded and released at the capture sites in Berkshire county.

Waterfowl

A total of 298 ducks were banded during spring, summer and fall trapping efforts. The total included 235 wood ducks, 50 mallards, 6 black ducks, 3 mallard x black hybrids, 1 blue-winged teal and 3 hooded mergansers.

The airboat, destroyed in a 1986 accident, was not replaced, but Parker River NWR, Great Meadows NWR and Division personnel combined efforts to airboat the Great Meadows NWR impoundments using the Parker River NWR airboat. A total of 56 wood ducks were banded under the Division's permit. Twenty-three mallards, 11 green-winged teal and 4 blue-winged teal were banded under the Great Meadows NWR permit.

A total of 136,025 waterfowl were counted during the January, 1988 mid-winter coastal survey. Black duck numbers were down from both 1987 (-7%) and down from the 10 year average (-11%) Only goldeneye and eider numbers were up over last year's duck count. The 1987 eider count, however, was a 25 year low, so although the 1988 eider count was 35% below the 10 year average, it was still above the 1987 figure. The 1988 Canada goose count (18,135) was the highest on record.

In addition to the aerial coastal waterfowl survey, a ground survey was made of sites where people feed waterfowl. This survey has been conducted every five years since 1973. A total of 19,511 mallards, 2,232 black ducks, 1,264 Canada geese, 33 American wigeon, 13 pintail, 9 wood duck, 6 green-winged teal, 36 coot and one gadwall were counted at 163 locations in 87 communities across Massachusetts during the period of January 9-24, 1988 period. The 1988 mallard count was 49% higher than in 1983, and the black duck count was up 33%.

The winter of 1987-88 began with mild conditions but January brought a series of very cold spells followed by mild periods with temperatures approaching or exceeding 50 degrees F. There were several moderate snow falls during the winter resulting in 100% snow cover at times. Division personnel and cooperators banded 386 black ducks, 97 mallard x black hybrids, 51 mallards, and a pintail.

During a five year study of nest structures, wood duck use of wooden boxes was higher than use of plastic buckets (26% vs. 12%) on 13 new areas. It was also higher in boxes on established areas (57% vs. 37%). Nest success was also higher in wooden boxes. It is more economical to use wooden boxes than plastic buckets because buckets, though cheaper to make, do not last as long as wooden boxes and require more frequent replacement.

The results of a study on biological tagging of wood ducks were presented by James E. Thul at the North American Wood Duck Symposium held in St. Louis. Thul's blood parasite tagging data were supported by band recovery data presented in a paper at the symposium by Heusmann of Massachusetts. The two studies demonstrated that Virginia is harvesting a substantial number of northern wood ducks in its early, liberal bag season in October. The prevalence of northern wood ducks in southern states in October declined markedly south of Virginia.

Wood duck production continued at high levels with 256 successful nests from 314 nest starts in 681 boxes located on 50 statewide study areas.

There were also 13 successful hooded merganser nests.

A pilot study to determine numbers of breeding mallards and black ducks was conducted during the spring of 1988. Massachusetts, Rhode Island, Connecticut, New Jersey, New York, and Pennsylvania participated. The results were encouraging and a three-year study, beginning in 1989, will involve all of the flyway states from Virginia north.

A total of 674 Canada geese were banded during preseason drive trapping efforts on 7 sites, but only 33 geese were winter trapped and banded. A total of 312 pairs of geese were counted on 232 half mile square plots and 3 reservoir systems located in 7 regions of eastern Massachusetts as part of a nesting study. Total number of pairs in the 7 regions were estimated to be 3,562 plus or minus 30%. The total state nesting population is estimated to be 6,000 pairs. A total of 40,354 goose observations were made in a migration survey conducted between September, 1987 and February, 1988. There were observations of collars involving 48 individual birds. Collar and count data indicate migration peaked in November.

During 1988 the Division conducted an experimental late goose season. During this season 3,482 sportsmen received hunting permits. Of these, 1,793 (51%) actually hunted for geese during the period. Of these, 749 (42%) were successful in harvesting one or more geese during the late season. A total of 6,459 trips were made during the 16 day season and 2,927 geese were harvested. Fourth and fifth birds in the bag accounted for only 5.3% of the late season goose harvest. A "memory and prestige" correction factor suggests the actual harvest was probably lower.

A full report was made to the U.S. Fish and Wildlife Service on Massachusetts' five year zoning experiment. The U. S. Fish and Wildlife Service is currently evaluating the entire zoning issue and may require suspension or modifications of zoned seasons depending on the outcome of that evaluation. Massachusetts will continue to hold zoned seasons in the interim.

Falconry

At this point the Division has licensed 11 apprentice falconers, 16 general falconers and 7 master falconers. In addition, the Division has issued 6 raptor propagation permits and 27 raptor salvage permits.

Mammals

Furbearers

Beaver — The 1987-88 beaver trapping season ran from November 15 to February 28 statewide. During this season, a total of 1,695 beaver were taken by 117 trappers in 125 towns, with a mean take of 14.5 beaver per successful trapper. This take represents an increase of 324 beaver (23.6%) over 1986-87. Harvests increased in all counties except Worcester. Berkshire, Essex and Middlesex counties increased by 70-113 percent while increases in the Connecticut River Valley counties were between 10-20 percent. The harvest in Worcester county declined 22.6%. For the first time since 1982-83, the harvest in the western region (west of the Connecticut River) exceeded that in the eastern region.

Coyote — A total of 79 coyotes were taken by 48 sportsmen in 47 towns and eight counties during the 1987-

An eastern coyote lopes away after scenting the photographer.

88 hunting season. The majority were taken in November. Nine depredation reports were received; primarily involving sheep or lambs.

Otter and Fisher — During the 1987 otter season, 76 successful trappers took 181 otter in 85 towns and 10 counties for a mean take of 2.4 otter per successful trapper. This compares with a harvest of 94 and a mean take of 1.6 in 1986. Worcester (73) Berkshire (24) Franklin (21) and Essex (20) counties yielded the most otter. Otter carcasses were turned over to the Massachusetts Cooperative Wildlife Research Unit for analysis.

The number of fisher taken increased from 201 in 1986 to 248 in 1987, with 69 successful trappers taking an average of 3.6 fisher each among 67 towns in seven counties. In 1986, 57 successful trappers took an average of 3.5 fisher each. The top counties were Worcester (130 fisher) Franklin (53) and Essex (33). A total of 240 fisher carcasses were received from cooperating trappers. The mean age of fisher in 1987 was 1.43, as compared to 1.51 in 1986. Twenty-five (81%) of 31 fisher aged 1.5 and older showed evidence of reproductive activity. Average corpora lutea counts were 2.6 in 1987, compared to 2.2 in 1986.

Bobcat — A total of 35 bobcats were taken in 1987-88, including 12 by hunting, 21 by trapping, and two road kills. The mean take by a successful hunter was 1.1 and per successful trapper was 2.0. Twelve trapped bobcats were taken in November and 10 in December, while January and February were the most successful months for hunting.

Statewide Furbuyers Tallies — A total of 26 furbearer licenses were issued. Pelts received by furbuyers were 83 opossum, 1,077 beaver, 20,059 muskrat, 121 coyote, 281 red fox, 83 gray fox, 5,857 raccoon, 85 fisher, 801 mink, 25 striped skunk, 179 river otter and 10 bobcat pelts.

Black Bear

A total of 1,048 bear hunting permits were issued for the 1987 hunting season. A record total of 34 bear were taken during the two-week split season, including 32 during the first segment and two during the second segment. Fourteen males and 20 females were taken in Berkshire (5) Franklin (14) Hampshire (12) and Hampden (3) counties. Three road kills, two nuisance kills, and one illegal kill were recorded. A total of 39 complaints were received, primarily corn (15) and beehive (10) damage. Field studies of bear habitat use, reproductive success, and behavioral interactions continue to be conducted in conjunction with the Massachusetts Cooperative Wildlife Research Unit.

White-Tailed Deer

Division biologists were involved in research, management, and eductional activities that reached many citizens of the Commonwealth and led to better understanding and control of the state's estimated 45,000 deer.

The major research effort was aimed at analyzing herd growth and conditions across the state. During the 1987 deer hunting seasons, approximately 70,000 hunters shot 5,596 deer. Division staff collected biological data on almost 40 percent of the deer taken. Yearling male antler beam diameter measurements and deer weights indicated that the increasing deer herd size has not affected the good condition of the deer and their range.

In an effort to better understand deer population dynamics, the deer project leader developed a computer-based population model. This model is currently being tested by biologists and managers throughout the Northeast. Following testing and modification, the model will be used as a management tool that will provide objective analysis of deer populations based on harvest and age data collected during the hunting season. The Division also sponsored a fawn mortality study through the Massachusetts Cooperative Wildlife Research Unit at the University of Massachusetts.

During 1987, Environmental Police Officers submitted 905 reports of deer dying of non-hunting mortality factors. These reports help assess the need to control deer numbers in certain areas of the state. Statewide, 707 deer were killed in deer-vehicle accidents.

The basis of deer management in this state is the control of the harvest of female deer during the shotgun deer season through the antlerless permit system. Approximately 37,000 sportsmen applied for antlerless permits and the Division issued 10,333 permits in 14 deer management zones. The $5.00 permit fee generated over $51,000 toward costs associated with running the deermanagement program. Archers and primitive firearm hunters contributed another $125,000 to Division programs through the purchase of a stamp that allows them to hunt deer during special seasons. In addition, deer hunters in this state contributed approximately $35 million to the state's economy through purchases associated with hunting (i.e. hunting equipment, transportattion, food and lodging).

Based on information gathered on land use trends, deer population indices and and deer-human interaction, the Division increased the bag limit from one to two in management zones 12, 13 and 14 (Barnstable, Dukes, and Nantucket Counties) This decision will create consistent regulations across the state and will allow hunters the opportunity to harvest two deer in these three areas that are experiencing high development pressures resulting in decreased habitat and higher deer densities.

Carl Germain and family of Hardwick and his 206 lb. buck

Forestry for Wildlife

Progress was made on each of the forestry program's three objectives, which are:

1. Build an inventory data base for each wildlife management area (WMA), and establish boundary lines in the field.
2. Use inventory data to design and carry out commercial forest cutting operations that improve wildlife habitat on, and human access into, each WMA.
3. Determine the response of wildlife populations to forest cutting operations.

Commercial forest cutting operations continued on a portion of the Hy Fox WMA in the Towns of Chester and Worthington. Gagnon Brothers Logginghad been awarded the original contract through a public, competitive bid. An additional 110,000 board feet of timber and 400 cords of firewood were sold in exchange for construction equipment, material and labor used for building a major access road into this 1,000 acre portion of the Hy Fox WMA.

A contract for a second commercial forest cutting operation on another portion of the Hy Fox WMA in the Town of Chesterfield was awarded to Sarafin & Sons of Chesterfield. A total of 25,000 board feet of timber and 50 cords of firewood were sold in exchange for machinery and labor to reclaim an old apple orchard, to obtain and plant additional wild stock apple trees in the orchard, and to conduct site preparation aimed at regenerating white pine in the commercial sale area.

A contract for a commercial forest cutting operation on the Bitzer State Fish Hatchery in Montague was awarded to Michael Zagula of Indian Orchard. A total of 95,000 board feet of timber was sold in exchange for insured machinery and labor to remove large trees threatening electric lines and buildings on the hatchery grounds, and for delivery of both rough and finished lumber for construction projects at the hatchery.

For the third consecutive year, a ruffed grouse drumming census and a breeding songbird census were conducted on a portion of the Hy Fox WMA in Chester and Worthington. These data will be used to evaluate the response of wildlife populations to the on-going forest cutting.

The forestry program continues to benefit from interaction with the Massachusetts Cooperative Wildlife Research Unit and the University of Massachusetts Department of Forestry and Wildlife. Two senior level students (a forestry major and a wildlife major) were hired by the Department through the Co-op Unit, and conducted a forest inventory on 1,200 acres of the Peru WMA.

Work planned for the next fiscal year includes finishing the forest inventory and boundary work on the Peru WMA, and initiating a commercial sale on either the Fox Den WMA, or the Peru WMA.

Statewide Development

The Statewide Development Project is charged with the operation of Wildlife Management Areas and the construction and maintenance of nesting structures.

Wildlife management area operations include actual habitat management, as well as public access work, planning and special projects such as controlled hunting.

Nesting structure work includes the erection and maintenance of wood duck nesting boxes, osprey nesting platforms and bluebird nest boxes. Loon nesting rafts are also constructed and maintained on Quabbin and Wachusett Reservoirs.

Additional research studies

A number of additional research projects were carried out during the year by staff and students of the Massachusetts Cooperative Wildlife Research Unit working in conjunction with staff of the Division of Fisheries and Wildlife. Among these were:

Harvest Survey Analysis — This study has been completed. The Division game harvest survey methodology was studied from 1985 through 1987. Sampling techniques and estimation procedures were

A fawn search is conducted in southern Berkshire County by personnel from the Univ. of Mass. and the Div. Fisheries and Wildlife .

analyzed for statistical soundness and computer simulation programs were used to demonstrate the effects of unequal probability sampling on the distributions of survey estimates. Recommendations for future surveys include continued use of telephone surveys with adjustments in sample size and estimation procedures.

Movements, Mortality, and Habitat Use of White-tailed Deer Fawns Sixteen radio-collared fawns were monitored from June to December 1987. Mortalities, movements and habitat use were recorded. Nine uncollared fawns were also monitored for mortality by following the movements of nine collared adult does.

During the shotgun season in December, data were collected at two check stations in deer management zones 01 and 03. Weight, sex, age and various measurements were taken from 260 harvested deer. These data will be compared with identical parameters recorded in 1986, and with those from road-killed deer collected in the study area from February to April.

Winter capture of adult females netted three animals which were ear-tagged, collared and released. The males were ear-tagged only. Ground searches for fawns located 16 fawns which were captured and fitted with radio collars.

One 14-day-old female, radio-collared in 1987, died of a probable umbilicus infection. No mortalities were detected for 23 other monitored fawns in 1987. Three adult mortalities occurred.

Black Bear Behavioral Interactions and Reproductive Success — Four adult females and one adult male were monitored through fall 1987. One female was killed during the legal bear season and another illegally killed in November. Two yearlings belonging to a third female were radio-collared in the winter den. An additional 10 bears (4 males, 6 females) were captured and radio-collared between March and June 1988. Capture efforts will continue through August. Adult bears are located at least once weekly. Yearlings and sub-adults are located and monitored at least twice weekly.

River Otter Habitat Use and Movements — Wetland areas in Worcester county were selected on the basis of size, type and proximity to human activity, and 139 locations were scouted on foot for river otter sign. The amount of sign was recorded and the area evaluated for live-trapping potential. Capture success was very low for the 1987 field season, with only one capture (animal subsequently escaped) in 2135 trap nights.

River Otter Contaminant Analysis and Population Dynamics — Contaminant data from river otters taken during the 1986 Massachusetts trapping season were received. These data were compiled and a preliminary analysis made. Comparisons were made between otter contaminant values and fish mercury and PCB data from the same watersheds.

Game Releases

On September 24, 1987, the Fisheries and Wildlife Board voted to end the rearing of pheasant and quail at the Sandwich Game Farm in a move to contain the rising costs of the game bird propagation program. The Sandwich facility will be maintained as a holding facility for quail to be purchased from private vendors. For 1989, stocking pheasant production will continue with the Ayer Game Farm at full capacity (30,000) and about 15,000 pheasants will be purchased from private vendors.

Some 240 linear feet of brooder house roof was replaced at Ayer by private contract. Staff conducted routine maintenance of buildings, pens and grounds.

Brood stock were inoculated against fowl cholera. No unusual disease problems were encountered and all production goals were met.

A total of 40,906 pheasant, 3,566 quail and 500 snowshoe hare were released immediately prior to or during the 1987 hunting season. An additional 5,258 pheasant were provided to clubs participating in the cooperative rearing program. The pheasants were produced at the Ayer and Sandwich game farms. All quail were produced at the Sandwich game farm. The snowshoe hare were purchased from a New Brunswick vendor.

Wildlife Staff

Wayne F. MacCallum
Assistant Director for Wildlife Research

Robert Bellville
Richard Burrell
James E. Cardoza
Thomas Early
Marcia Hartleb
H W Heusmann
E.M. Pollack
John Scanlon
Dr. Steven Williams

Game Farm Staff

Ayer Game Farm

Stephen Foster, *Manager*
Robert Bennett
Mark Brideau
Richard Donohue

Sandwich Game Farm

John Prouty, *Manager*
Jack Almeida
Robert Gallagher
Ernest Green
Kenneth Weaver

NATURAL HERITAGE
AND
ENDANGERED SPECIES

Dr. Thomas W. French
Assistant Director, Natural Heritage and Endangered Species

On April 1, 1988 five Natural Heritage staff became full-time state employees. These staff members had formerly been employees of The Nature Conservancy, provided to the Division through a contract. These new state positions include:

1. Natural Heritage Coordinator - Henry Woolsey
2. State Botanist - Bruce Sorrie
3. Plant Community Ecologist - Dr. Pat Swain
4. Program Zoologist -Dr. Scott Melvin
5. Environmental Reviewer - Jay Copeland

A full time Data Manager (Meg Goodwin) and a part-time Public Lands Registry Specialist (Annie Woolsey) remain positions that are provided through a Nature Conservancy contract.

The 1986 wildlife habitat amendment to the Wetlands Protection Act and the resulting amended regulations prompted the Division to seek and obtain from the legislature in 1987 a new state-position for a Wetlands Wildlife Biologist. This position was filled on January 19th when Steve Roble joined the Section staff. The total full-time staff of the Natural Heritage & Endangered Species Section in state positions now numbers nine. The total functional staff increased by two in FY '88 and now numbers 10 full-time, one part-time and from one to four interns or work-study students.

Inventory Research and Management

Based on the best scientific data available and after consultation with the Nongame Advisory Committee, the Division added seven animal species to the official state list of Endangered, Threatened, and Special Concern Species in FY '88. The added species were: 2 fish (one previously considered extirpated), 1 whale (not previously documented in Massachusetts waters), 1 damselfly (previously considered extirpated), 1 freshwater snail and 2 freshwater crustaceans. The only other change to either of the state Endangered, Threatened, or Special Concern plant or animal lists was that the status of the Roseate Tern was upgraded to Endangered because of its listing as federally Endangered in December, 1987.

The Section continued to work on a wide variety of inventory, research, and management projects on endangered, threatened, and special concern species, as well as other components of the state's biological diversity. Major wildlife, plant, and natural community projects are listed below. Certain Small Research Contract Program-funded projects are also included below and are denoted with an asterisk.

Birds

Piping Plover - The Section continued investigations of Piping Plover (federally Threatened) population dynamics, habitat use, and management needs, in collaboration with Dr. Curtice Griffin, University of Massachusetts at Amherst. Research was expanded in 1988 to examine aspects of foraging ecology and impacts of off-road vehicles on this shorebird, and involved three graduate students and several technicians.

A female peregrine falcon over Springfield.

Results to date have demonstrated that predation is a much more serious fac-factor limiting nest success than originally believed, but that nest monitoring and other research activities do not result in increased nest predation and may, in fact, have the opposite effect. Survival rates of both adult and juvenile plovers are higher than expected. Adults show moderate levels of site fidelity but may also disperse to breeding sites as far as away as Connecticut. Predator exclosures have been field tested and found to be a safe and effective means of reducing nest loss due to foxes. The Section con-continued to coordinate and motivate all cooperators involved in Piping Plover monitoring and management activities in Massachusetts. Management activities statewide have intensified steadily since 1984. After a significant population decline in 1987, preliminary figures for 1988 show increases in both total breeding population and productivity.

Dr. Scott Melvin co-authored, with other Recovery Team members, the Atlantic Coast Piping Plover Recovery Plan. The final version was issued in March, 1988.

Terns - Preliminary results of the June, 1988 Tern inventory show Common Terns continuing to increase with 9,538 pairs reported, up 8% from 8,869 pairs in 1987. Least Terns reached a record 2,676 pairs at 50 sites, up from 2,109 pairs a year earlier. Roseate Terns (listed as federally Endangered, December 1987) number 1,654 pairs (primarily at one island in Marion) and Arctic Terns 17 pairs at 5 sites; both species about level with 1987 results. The 1988 tern census was considerably aided and improved by a special workshop held May 26th at Cape Cod Community College.

Peregrine Falcon - From four eggs, two young Peregrine Falcons hatched on May 18, 1988 at the Customs House Tower in Boston. It was the first totally wild hatching of peregrines in Massachusetts in 42 years. A second pair of peregrines resided in Springfield but no breeding activity was documented.

Bald eagle - Our annual mid-winter survey, conducted on January 8, 1988, recorded a total of 45 Bald Eagles (federally Endangered) statewide. On February 17, 1988, "Iolar," an immature Bald Eagle found exhausted in Ireland in December 1987 and transferred to the U.S., was released at Quabbin Reservoir, attracting worldwide attention. During FY '88, eight more Nova Scotian eaglets were reared and released at the Quabbin Reservoir, bringing to 42 the total number "hacked" at Quabbin since the project's inception in 1982. In spring, 1988, two (possibly three) territorial pairs of eagles were monitored in the Quabbin Reservation. Two of these pairs have built nests. All the territorial birds are banded, and two are definitely Massachusetts-released birds. One of these, nicknamed "Ross," is from the first eagle release in 1982.

Short-eared Owl - Studies of Short-eared Owl population dynamics and habitat use continued on the islands of Nantucket and Tuckernuck. Breeding populations of this ground-nesting owl have remained relatively stable during the period 1985 -1988; however, preliminary results from 1988 indicate that timing of nesting was delayed and productivity was reduced by the low prey densities recorded during the four years of the study. Precise information on distribution and habitat requirements of both Short-eared Owls and Northern Harriers generated by this study played a part in a number of land use planning and acquisition decisions affecting the maritime heathlands on both islands.

Osprey - Management activities were highlighted by the installation of 11 new nest poles in Barnstable and Bristol County. In 1987 there were 117 active nests (all coastal) in the state, producing 218 young. These figures compare very favorably with 24 active nests and 19 young in 1977; 1988 data are not yet complete.

Common Loon - Nesting activity in Massachusetts remained stable in 1988 with 9-10 territorial pairs on five waterbodies. There was record production in 1988, with nine chicks fledged. The project deployed five traditional nest rafts; one was utilized. The water level at Wachusett Reservoir was fixed in cooperation with the MDC to avoid flooding of a loon's nest there.

Grassland Birds - Studies continued at the Westover Air Force Base in Chicopee to inventory and develop management recommendations for the base's grassland bird community, as part of a 3-year study funded by the U.S. Air Force. A companion study was initiated at Fort Devens, where the state's most diverse grassland bird community occurs on the 250-acre Turner Drop Zone.

Songbirds - Responding to widespread concern about songbird declines throughout the continent, especially declines in tropical-wintering passerine populations, State Ornithologist Brad Blodget, initiated a study at the Hy Fox Wildlife Management Area in Chester in 1984 to collect baseline population data. This study is also designed to demonstrate the impacts of the Division's forest cutting practices on nesting songbird populations. Preliminary examination of data collected in June 1988 show some 67 species identified, with red-eyed vireo and ovenbird recorded most frequently. The index involves collecting data along 14 miles of tran-transects at some 327 "listening stations."

Eastern Bluebirds - Bluebird nesting box "demonstration trails" are now set up in all Division districts except the Western District. At the trail on the High Ridge Wildlife Management Area in Gardner, a record 10 pairs of bluebirds appeared during the spring of 1988, producing 90 eggs from which 51 young birds successfully fledged.

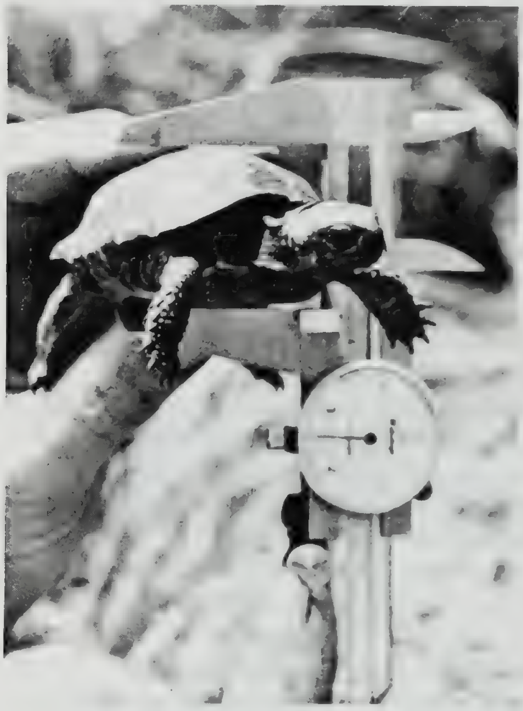
Mammals

Northern Right Whale - An eleven member Right Whale Advisory Group, made up of biologists, environmental lawyers, and an activist, was established within the Department of Fisheries, Wildlife & Environmental Law Enforcement in FY '88. The group advises the Department on Right Whale (federally Endangered) protection issues through Dr. Thomas French, the Assistant Director for Natural Heritage and Endangered Species. The group's most notable accomplishments to date include assistance in drafting the Department's recent report on the status of Right Whales in Massachusetts waters (submitted to the legislature as required by Resolution 12 of the Resolves of 1985) and a review of a proposed regulation to prohibit vessel operation within 500 yards of a Right Whale.

Reptiles and Amphibians

Plymouth Red-bellied Turtle - A total of 21 nests of the Plymouth Red-bellied Turtle (federally Endangered) were discovered between June 14 and

July 12, 1987 by Dr. Terry Graham of Worcester State College and his assistants under contract with the Division. Clutch size ranged from 10 to 16 individuals. The total hatch rate was 82.9%. A total of 180 hatchlings from 15 nests were transferred to eight institutions and individuals for "head-starting," rearing hatchling turtles indoors over winter. On June 2, 1988, the surviving 149 "head- started" turtles (83 % survival rate) were released at eight ponds in Plymouth County.



Taking measurements on a young bog turtle in southern Berkshire County.

Bog Turtle* - Inventory work continued in Berkshire County for this very habitat-specific and secretive turtle. Due to this inventory, there are now three documented populations in the state.

Blandings Turtle* - Inventory was conducted in northeastern Massachusetts for this state threatened reptile.

Eastern Spadefoot* - Inventory on outer Cape Cod documented four new occurrences of this southern toad.

Jefferson Salamander* - The Section helped fund a research project investigating the effects of acid precipita- tion on the reproductive success of this Special Concern mole salamander in the Connecticut River valley.

Fish

American Brook Lamprey* - Population sampling and water chemistry testing were conducted on Cape Cod in one of the two drainages in the state in which this species occurs.

Invertebrates

Dragonflies* - For the second year the Section helped fund a project by the Cape Cod Museum of Natural History inventorying the dragonflies of southeastern Massachusetts, with particular emphasis on three rare Coastal Plain pond species.

Puritan Tiger Beetle* - An inventory of the Connecticut River for this globally rare insect was initiated, and one population was located.

Decodon Stem Borer Moth* - Surveys were conducted in 40 wetlands in southeastern Massachusetts for this endemic insect. It was found in 11 towns.

Plants

Long's Bulrush - Bruce Sorrie, the State Botanist, relocated a population of this globally rare plant in New England for the first time in 38 years.

Variable Sedge* - Recently rediscovered in Massachusetts, this species is a candidate for possible federal listing. A research contract was awarded to a Carex specialist to study the genetic variability of this species.

Small Whorled Pogonia - A third population was discovered of (what was then) Massachusetts' only federally Endangered plant. All populations receive at least some protection and appear healthy.

Crested Fringed Orchis - This orchid, re-discovered in the state in 1987, was last documented in New England in 1908. The Program worked with the agency that owns the site to ensure the active protection of this small population.

Sandplain Gerardia* - This small snapdragon, thought extinct worldwide before its re-discovery by the Program Botanist in 1980, was formally proposed in FY '88 for federal listing by the U.S. Fish & Wildlife Service. Only nine surviving populations are known to occur in the world. In Massachusetts, both populations of this annual plant suffered serious declines. A study was initiated to determine the species' reproductive biology.

Tiny-fruited Spike-rush - This sedge was discovered in the state and is only the second New England record.

Natural Communities

Pitch Pine/Scrub Oak Barrens* - Research by Dr. William Patterson of the University of Massachusetts on the management of this fire-maintained community included selecting an area of Myles Standish State Forest for a small, experimental, controlled burn. Patterson also prepared brush-cut comparison units. He conducted intense pre-treatment vegetation sampling, and he cut fire breaks. The prescribed burn itself was postponed to the winter of 1988-89. Inventory and delineation of the occurrences of pine barrens around the state, with sampling and monitoring to establish diversity of and changes in the community, were begun. Records of the fire history of the various sites will incorporate the community descriptions with the fire research.

Sandplain Grasslands* - In conjunction with The Nature Conservancy, management of Katama Plains, one of the state's exemplary Sandplain Grasslands, proceeded with annual vegetation monitoring and prescribed burns in the fall and spring. Areas burned last year were very lush and covered with flowers this summer. The fall burn succeeded in killing pitch pine and shrubs invading the open areas. There appear to be reduced tick populations in the areas burned. A community description, incorporating the variation and diversity found in the sandplain grassland communities around the coastal plain, is being developed.

Calcareous Wetlands - Dr. Patricia Swain, the Section's ecologist, continued an inventory of calcarreous wetlands in Berkshire County, with visits to known exemplary sites for comparison and potential sites located from maps and aerial photos. A formal community description, with the variations included in the major type, is being developed. The Section assisted The Nature Conservancy's annual monitoring of one major calcareous fen that has several state listed rare plant and animal species.

Coastal Plain Pondshores* - Research on this high priority natural community was continued by Richard LeBlond of the Center for Coastal Studies, with emphasis on the normal variation and diversity of floral constituents found in this community type. A fact sheet describing the characteristic vegetation, geologic and topographic properties of the pondshore habitat was prepared for use by the public.

Atlantic White Cedar Swamps* - Inventory and definition of the types of subcommunities was undertaken by Glenn Motzkin, a graduate student at U. Mass. He will include a discussion of the variation found among sites of this often disturbed community. A fact sheet of the general community type was written to emphasize the importance of the community to the general public.

Other Projects

Data Management

Over 400 new records of endangered, threatened and special concern species were mapped and computerized in the Natural Heritage database in FY '88. In addition, 300 existing records were updated to incorporate information from more recent field work. Cumulative summaries of the Section's data bases are as follows:

"Element Tracking" (# of taxa, etc):
Plants
282 species (194 on official state list)
Vertebrates
525 species (73 on official state list)
Invertebrates
287 species (89 on official state list)
Natural Communities
20 high priority communities
"Other"
16 (includes heron rookeries, bat hibernacula, migratory shorebird stopover areas, etc.)

"Element Occurrence" (# of site-specific occurrences):

Plants	2988
Vertebrates	1119
Invertebrates	230
Natural Communities	31
Managed Areas:	705

(publicly owned or private conservation properties mapped on USGS topographic maps)

Source Abstracts:	905

(bibliographic references computerized)

Environmental Review
Reviewing the environmental impact of development projects on rare species sites continues to be a major Section function. The Section continued to review projects through Army Corps of Engineers public notices, the State's MEPA process, the state Dept. of Public Works, the federal "A-95" review process, private consultants, local government and other miscellaneous reviews. The Section's project review workload is now about 1700 reviews a year.

Effective on November 1, 1987, the Section's rare species occurrence data started being used in regulation for the first time. The state Wetlands Protection Act regulations now require all project proponents to consult Section-prepared maps of rare wildlife habitat (includes invertebrates but not plants) in wetland resource areas and, if in an "estimated habitat," to contact the Section for determination of the actual habitat and an assessment of the project's impacts to the rare wildlife habitat. The Section prepared Estimated Habitat Maps for 840 occurrences of state-listed rare wetlands wildlife and distributed them to 240 town Conservation Commissions and DEQE offices. During FY '88, the Section reviewed 248 wetlands project filings of which 66 (or 27%) were in the actual habitat of a rare wildlife species (mitigating measures were suggested for 25 of these) but the Section recommended denying only three projects due to adverse impacts. The Section also acquired the additional responsibility of "certifying" vernal pools (small seasonal pools that are important breeding habitats for amphibians) for special protection under the Wetlands Protection Act. The Section developed and is distributing certification guidelines detailing the criteria to be used, and the documentation needed, to implement the protection of this important wildlife habitat.

Nongame Wildlife Fund Promotion
Many of the following promotional materials were produced by Galler & Galler, a private advertising company, to help promote contributions to the Nongame Wildlife Fund, the Section's primary source of funding. The following list itemizes promotional and educational materials produced and distributed in FY' 88, as well as other related activities:

1. Promotional poster with 9 color photos ("Five Years of Generous Taxpayer Support") 8,000 copies printed.

2. Full color N.H. & E.S. Program brochure - 50,000 copies printed. Direct mailing of Program brochure to all certified public accountants (CPAs) in the state.

3. Boston subway advertising card featuring a Short-eared Owl ("Why we're asking you to give money to an individual that has a summer home on Nantucket") - 300 copies displayed in subway cars in February and March.

4. Promotional advertisement featuring a Piping Plover ("Human Nature") inserted in Massachusetts C.P.A. Review's winter issue.

5. A 10-second television Public Service Announcement produced and distributed to eight TV stations (a "Thank You" spot with a Common Loon).

6. Right Whale conservation poster produced for Whale Awareness Day (May 5) - 2,000 copies printed.

7. Rare species fact sheets - continued preparation of one page fact sheets on specific rare plant and animal species. Over 150 now completed.

8. Worked on a Natural Heritage & Endangered Species Program logo, several promising designs were reviewed.

Budget Summary

Income:

Nongame Wildlife Fund, contributions from tax year 1986 - $419,443

Federal reimbursements:
Endangered Species Act, Section 6
Plymouth Red-bellied Turtle - $12,000
Piping Plover - $ 6,400
U.S. Department of Defense - $ 4,700
(Grassland bird study at Westover AFB)

Appropriations:
Nongame Management (account 2315-0100) - $361,627 appropriated from Nongame Wildlife Fund.
Natural Heritage (account 2310-0500) - $141,000 appropriated originally from General Fund, amended in July 1988 to be charged 50% each to Nongame Wildlife Fund and Inland Fish & Game Fund.

Section Expenditures: FY '88 actual spending figures:
Nongame Management Account - $265,972
Natural Heritage Account - $132,791

Natural Heritage & Endangered Species Staff

Dr. Thomas French
Assistant Director for Natural Heritage and Endangered Species

Bradford G. Blodget
William Davis
Jay Copeland
Dr. Scott Melvin
Dr. Steven Roble
Bruce Sorrie
Dr. Patricia Swain
Henry Woolsey

INFORMATION & EDUCATION

Ellie Horwitz
Chief, Information & Education

The primary function of the Information and Education Section is to serve the public by offering information about wildlife conditions, issues and opportunities in the Commonwealth. In this capacity all members of the Section responded to telephone and mail inquiries, presented informational programs to citizens groups, and prepared written copy for various print outlets. In addition, the Section issued 40 press packets comprising 147 press release items. These items were very well received, with newspapers printing an average of 326 articles a month containing information derived from these releases. In addition to issuing releases, the Section offered background information for members of the media seeking to prepare feature pieces, and set up field contacts where it was determined that these would assist in preparation of the piece. Specific attention was focused on particular issues and programs including:

- the annual deer tally
- restoration of wild turkeys
- restoration and return of Atlantic salmon
- restoration of peregrine falcons
- publication of the report by R. Keller on 30 years of Quabbin data
- Four events related to the eagle restoration program
- Release of young eagles reared at Quabbin
- Midwinter eagle census
- Release of an eagle sent to Massachusetts from Ireland
- Arrival of young eagles to be reared during the summer of 1988
- Signing of a bill to deed the Field Headquarters to the MDFW and of a resolution to honor Director Richard Cronin by naming the Field Headquarters building the Richard Cronin Building.

Annual Materials

As required by law, the Section produced and issued Abstracts of Migratory Bird Hunting Regulations for 1987 and Licenses and Abstracts of Fish and Wildlife Laws for 1988. Also produced were goose hunting permits, waterfowl hunting stamps and stamps for participants in the archery and primitive firearms seasons on deer. During this year Dan McGuiness joined the Section staff and began coordinating the preparation, production and distribution of licenses and abstracts.

Exhibits

During this period the Division put on five large, live-animal displays at the Hampden Co. Fair in Greenfield, the Eastern States Exposition in Springfield, the Topsfield Fair, the Eastern Fishing and Outdoor Exposition in Worcester, and the Springfield Sportsman's Show. These exhibits were designed, placed and manned for the run of the various exhibitions. The Division also prepared smaller, photographic exhibits for a number of smaller shows and single day special events.

Photography

The photography section provided photodocumentation of Division projects and programs throughout the year.

Copies of pictures were provided for *Massachusetts Wildlife* and for other publications promoting Massachusetts or creating a better understanding of wildlife in the Commonwealth. Special photo assignments included documentation of waterfowl studies and problems, introduction and release of bald eagles, introduction and release of peregrine falcons, selected rivers for the Massachusetts Riverways Atlas, release of the eagle sent from Ireland, and dedication of the Richard Cronin Headquarters Building. Selected photos from all of these projects and the files were reviewed and utilized for *Massachusetts Wildlife* and for a proposed wildlife calendar.

Publications

The major publication issued by the Division of Fisheries and Wildlife is *Massachusetts Wildlife*, which was first offered on a subscription basis in 1986 and completed its second year of operation in FY '88. Four 40-page, issues were published during this year. A subscription renewal campaign and related materials were developed. Promotional materials were developed and techniques for distribubution were identified and inaugurated. The transition to paid subscriptions and the associated complexities of fulfillment of subscriptions progressed very smoothly and by the end of FY 1988 the magazine had 19,212 paid subscribers. As this publication operates on a separate fund, the editors prepared an annual report for calendar 1987 and a budget for calendar 1988.

MASSACHUSETTS WILDLIFE
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MASSACHUSETTS WILDLIFE

MASSACHUSETTS WILDLIFE is the major publication of the Information and Education Section, with over 19,000 paid subscribers.

In addition to issuing *Massachusetts Wildlife* the Section updated and reissued publications including:

- A list of trout stocked waters
- Best Bets for Bass fishing
- Locations of northern pike and tiger muskies
- regulations for Wildlife Management Areas
- regulations for wildlife sanctuaries
- List of towns with restrictions on hunting
- Beavers in Massachusetts
- Wood Duck in Massachusetts
- Yellow Perch in Massachusetts

New publications included:

- An introduction to the Division of Fisheries and Wildlife
- A new brochure for the Mass. Junior Conservation Camp
- A brochure on orphaned animals (If You Care Leave Them There)
- Bird checklists for Bolton Flats and the Eugene Moran WMA
- A listing of Whom to Call When...

Uniforms

Visibility is a key issue for the Division of Fisheries and Wildlife which, although very active in restoring and improving the fauna of the Commonwealth, is rarely noticed or identified by members of the general public. In order to make staff more accessible to the public it was decided to provide some form of identification and uniform clothing to Division staff members. During FY '88 the Division purchased name badges for field personnel, long sleeve and short sleeve shirts (1 each) for all field personnel, and a computerized system was developed to keep track of sizes and clothing allotments.

As part of a move to make the field headquarters more accessible to the public, signs were made to guide visitors to appropriate offices.

Education
Activities in this area focused primarily on two programs, the Massachusetts Junior Conservation Camp and Project WILD.

During this fiscal year the Conservation Camp held its 37th session. As in the past the Division conducted preseason publicity, and handled preseason administration and registration of campers. During the camp season Section staff members and Division research biologists taught sessions on Pond Ecology/Fisheries Management and on Wildlife Management. Section staff also developed and administered the final examination and participated in the camp graduation.

Project WILD gained considerable momentum during this year. A cadre of 55 facilitators offered 27 workshops, eight of which were offered by the Division's program coordinator. Key among these workshops were one facilitator training session and one session held under the auspices of the Department of Education. By the end of this year Project WILD in Massachusetts had provided training to some 800 educators. Assuming a teacher/student ratio of one to 25, this provides a WILD outreach to about 20,000 youngsters per year.

During this year, Aquatic WILD came to Massachusetts and the program coordinators and steering committee developed policy and procedures for the distribution of Aquatic WILD materials. Many facilitators were introduced to Aquatic WILD at the annual facilitator's gathering which offers a refresher and advanced program on WILD related projects. Aquatic WILD was also featured in a copy of the WILD newsletter which was issued to three times during the year and sent to all past workshop participants.

Adjunct materials, developed during FY '87, became available this year. They include a WILD coloring book for small children and for use in elementary classrooms, mugs for use by WILD teachers, and promotional tee-shirts. All have been well received and the income from the sale of these items, handled by the Massachusetts Audubon Society, has helped to underwrite the costs of the WILD Newsletter. To supplement these funds, which must be extended as the number of WILD workshop participants grows, the Coordinators launched a small fund-raising drive which met with much interest and some success.

In a move to coordinate with WILD proprograms in other states and to increase the efficiency of the Massachusetts program, the facilitators attended the National WILD Coordinators conference and made arrangements for a National WILD Steering Committee meeting to be held in Salem in October.

Special Programs and Events

Employees Conference Section personnel prepared an employees conference designed to familiarize staff with existing programs and with progress during the past year. Photo identification cards were provided to employees in the first stage of a three year program to offer cards to all staff members.

Fuertes Prints In August of 1987 final authorization was given for the Division to produce and sell a limited edition of prints of paintings by Louis Agassiz Fuertes with all income being divided between the Inland Fish and Wildlife Fund and the Massachusetts Nongame Fund. To establish this program, three prints were prepared, a marketing strategy and promotional materials were developed, sales procedures were established and a special low number drawing was held in December of 1987.

Wildlife Calendar Text was prepared, photographs selected, and a marketing strategy developed for a 1989 Wildlife calendar. This program was abandoned in June 1988 when it became apparent that printing funds would not be available. With approval of the Fisheries and Wildlife Board this material was donated to a cooperator who had donated graphic services to the project.

Tags 'n' Trout During calendar year 1987, 21 groups joined with the Division in sponsoring statewide Tags 'n' Trout programs through which 442 specially tagged fish were released as part of a program to highlight Massachusetts' outstanding fisheries.

Sportfishing Awards This program, which provides information on the location of trophy fish in Massachusetts, operates on a calendar year basis. During 1987, 711 pins were offered to anglers taking exceptional fish in 20 categories. A new affidavit form was developed and confirmation of fish identification was made easier by the requirement that every entry be accompanied by a photograph. Six new check stations joined the program and new state records were set for four species:

Northern Pike - 34 lb. Chas. Pucelli
White Catfish - 9 lb. 3 ozs Mike Payne
Tiger Muskie - 19 lb. 4 oz. Al Farland
Bullhead - 3 lb. 8 oz. Janet Bourgeois
(tied existing record)

The Sportfishing Awards Program encourages fishing for some of our less well known species such as channel catfish in the Connecticut River.

Waterfowl Stamp Competition and Exhibit
Twenty five artists from all parts of the nation entered the 1987 waterfowl stamp competition. The contest, judged by a panel of artists and decoy experts, ended with the selection of Bob Piscatori's painting of a cork-bodied mallard drake carved by A. Elmer Crowell. Following the competition all entries in the program were placed on two week exhibit at the Peabody Museum, Salem which houses the Division's archives on this program and which is a partner in a joint project celebrating decoys in Massachusetts.

Richard Cronin Building Dedication — Pursuant to a resolution passed by the legislature, the Division's Field Headquarters in Westborough has been named the Richard Cronin Building. To mark this occasion a special event was hosted in April of 1988 for representatives of environmental and sporting groups and members of the general public. Section staff coordinated the event at which visitors toured the facility and learned about Division programs in process.

Information & Education Staff
Ellie Horwitz, *Chief*
William Byrne Jr.
Dan McGuiness
Peter Mirick
John E. Swedberg

REALTY

William J. Minior
Chief, Wildlife Lands

A new half billion dollar bond issue was passed (Chapter 564 of 1987) granting the Division of Fisheries and Wildlife 30 million dollars for acquisition of lands along rivers and streams, land adjacent to existing wildlife areas and rare and endangered species habitat. Not less than 20% of these funds must be spent in the coastal zone. An additional 30 million are to be shared with MDC for acquisition of key parcels in the Quabbin, Ware and Wachusett watersheds. Unfortunately, funds did not materialize in Fiscal Year 88, but their announced advent precipitated considerable land acquisition activity.

Six consulting land agents were hired to assist District personnel in their acquisition efforts in spending remaining Chapter 723 MGL funds and targeting priority areas for the new bond money. Most of the 32 acquisitions in Fiscal Year 88 were handled through 723 funds, however, three gifts of land and a transfer were gratefully accepted. Acquisition efforts were primarily directed toward riparian corridors, including major rivers and cold water streams, and adjacent lands. A total of 2,989.3 acres were acquired bringing the total Division owned land to 55,540 acres or nearly 87 square miles.

The Western District benefited by the addition of 1,957.3 acres in nine separate acquisitions. Adjacent lands were added to the Hinsdale, Chalet, Stafford Hill and Hop Brook WMA's. Two new WMA's were created: the 196 acre Cummington area and the 200 acre Tracy Pond Area. A 110 acre parcel of excellent wildlife habitat was acquired in Windsor which is the source of Westfield Brook, a valuable tributary of the Westfield River. New areas of stream bank protection were added on the Konkapot and Westfield Rivers. All areas acquired are important, however of special note are the 1,010 acre addition which more than doubles the size of the Chalet WMA; and the 36 acre gift from the Berkshire County Land Trust and Conservation Fund which added substantially to the Hinsdale WMA.

The Connecticut Valley District acquired six tracts with a combined acreage of 577.5. Two separate acquisitions comprising the Catamount WMA were purchased adjacent to Catamount State Forest. It is excellent bear, deer and turkey habitat. Two tracts in Montague help to protect considerable Connecticut River stream bank and add substantial habitat to the abutting Montague State Forest. The Swift River and Satan's Kingdom WMA's were enhanced through one additional acquisition per area, increasing the total amount of Fisheries and Wildlife land in the Connecticut Valley to over 3,700 acres.

The Central District acquired 308.5 acres through five new parcels. Additions were made to the Quaboag, High Ridge, Phillipston and Westboro WMA's. A gift of 150 acres along the Five Mile River in North Brookfield acquired through The Nature Conservancy provides an excellent diversity of wildlife and wildlife habitat. The Five Mile River is a picturesque meandering stream seasonally stocked with trout by the Division. A transfer of 85 acres more or less from the Division of Capitol Planning and Operations has finally given the Massachusetts Division of Fisheries and Wildlife control of the Westboro Field Headquarters and increased the size of the Westboro WMA which now includes about 418 acres.

The Northeast Wildlife District land acquisition efforts were most successful on river corridors. Two acquisitions along the Nissitissit River have guaranteed continued public use of an important section of river through a residential part of Pepperell. A 16.13 acre purchase on The Squannacook River in Townsend contains nearly 1,750 feet of river frontage and connects directly with other publicly owned parts of the corridor. Individual acquisitions on The Sudbury River in Sudbury and on The Concord River in Billerica were cooperative efforts with DEM and municipalities to protect valuable open space slated for development. Each provides considerable river frontage and potential canoe access.

The Southeast Wildlife District land acquisitions included five river corridor tracts and additions to two WMA's. Three valuable acquisitions help to protect the Quashnet River on its journey to Waquoit Bay, preventing development along a considerable stretch of the river. The Nature Conservancy assisted in acquiring a tract on the Mashpee River and an approximate 1/2 acre access point was purchased on the Nemasket River in Middleboro. Small inholdings were added to both the Crane and Rocky Gutter WMA's, increasing wildlife habitat and solidifying boundaries.

Purchase of wetland habitat continues to be a priority for the Realty Section.

Cost Summary

WESTERN DISTRICT

Expended - $ 738,250.00
Acreage - 1, 957.30
Cost per acre - 377.18

VALLEY DISTRICT

Expended - $ 280,300.00
Acreage - 577.55
Cost per acre - 485.33

CENTRAL DISTRICT

Expended - $ 47,100.00
Acreage - 308.50
Cost per acre - 152.67

NORTHEAST DISTRICT

Expended - $ 676,020.00
Acreage - 110.93
Cost per acre- 6,094.11

SOUTHEAST DISTRICT

Expended - $ 1,463,479.72
Acreage - 35.06
Cost per acre - 41,742.15

TOTAL EXPENDED; $3,204.149.72
TOTAL ACREAGE ACQUIRED; 2,989.34
AVERAGE COST PER ACRE; 1,072.19

DISTRICT REPORTS

Northeast District, Walter Hoyt, *Manager*
Southeast District, Louis Hambly, *Manager*
Central District, Chris Thurlow, *Manager*
Conn.Valley District, Herman Covey, *Manager*
Western District, Tom Keefe, *Manager*

The five wildlife districts form the field presence of the Division of Fisheries and Wildlife administering wildlife lands, conducting on-site management activities and dealing with fish and wildlife issues pertinent to their region.

Staff from the districts implement fisheries and wildlife research projects, conduct trout and pheasant release programs, operate deer, bear, turkey and furbearer checking stations, and serve as liaison with sporting and conservation groups in their areas. All districts distribute licenses, abstracts and other materials related to hunting/ fishing license sales and assist officers from the Division of Environmental Law Enforcement in ensuring public adherence to wildlife laws and regulations.

During this past year District staff participated in a wide variety of research projects including the mid-winter eagle survey, waterfowl inventory and banding, census of mourning doves, woodcock, quail, and survey of great blue heron rookeries. They also monitored the pH levels of lakes and streams prior to stocking trout in those waters, reviewed the Environmental Monitor for development projects that affect wetland areas and provided advice on the control of environmental problems. One recurring item is the issue of control of nuisance animals. Perhaps the highlight of the year for most districts was the identification and acquisition of wildlife lands under the Division's expanded realty program.

District personnel also participated in certain projects implemented only or primarily in their particular region.

Staff of the Northeast District were heavily involved with cooperative agreements with farmers, with the release of wild turkeys in Boxford and Groton and with the release of Northern Pike into the Charles River, the Concord River and Whitehall Reservoir.

Southeast District staff constructed a storage building complete with lofts and storage platforms. They continued work on the Walleye project, tagging 75 adult walleyes. They took eggs from these fish, and from them 2000 fry were reared and stocked into Great Herring Pond. Quail census is particular to the southeastern district, as is the monitoring and maintenance of osprey nesting platforms.

Central District crews were heavily involved in the eagle restoration project. They also gathered data on landlocked salmon at Wachusett Reservoir and on landlocked alewives at South Pond.

Staff of the Connecticut Valley District initiated a brown trout study examining the forage value of smelt and alewives.

This district was also involved with the Swift River Improvement Project conducted by district personnel and volunteers from a wide variety of fishing groups. Conn. Valley staff also provided assistance to the eagle restoration project by providing food for the young eagles.

Western District staff participated in the live trapping of wild turkeys for release in more easterly areas. They also conducted a special deer hunt for paraplegic sportsmen.

District Staff

Northeast Wildlife District
Walter L. Hoyt Jr, *Manager*
Tom Sheehan, *Game Manager*
Peter Jackson, *Fisheries Manager*
David Ford
Russell Garland
Lawrence Howie
Howard Kreiser
Francis O'Meara

Southeast Wildlife District
Louis S. Hambly, *Manager*
Richard Turner, *Game Manager*
John Dixon, *Fisheries Manager*
Barbara Brockman
Joseph Comick
Edward Kraus
Peter Nelson
Richard Norton

Central Wildlife District
Chris Thurlow, *Manager*
Mike Ciborowski, *Game Manager*
Lee McLaughlin, *Fisheries Manager*
David Carlson
Cheyney Dodge
Paul LeBoeuf
Arthur Myers
Paul Orrizzi
Paul Ostrowski
Robert Thomasian

Conn. Valley Wildlife District
Herman Covey, *Manager*
Peter Pekkala, *Game Manager*
Philip Brenner, *Fisheries Manager*
John Boudreau
Michael Dumont
Andrew Foley, Jr.
Gary Galas
John Nowakowski, Jr.
Nelson Pratt
Martin Wrubel

Western Wildlife District

Thomas Keefe, *Manager*
Anthony Gola, *Game Manager*
Leo Daly, *Fisheries Manager*
Ed Hover
Joseph Kirvin
Jerry Shampang
David St. James

MAINTENANCE AND DEVELOPMENT

Stephen M. Henry
Senior Planner

Hatcheries and Game Farms

McLaughlin State Fish Hatchery's gravel packed well was rejuvenated, and underground fuel storage tanks at the hatchery passed their tests for tightness. East Sandwich State Fish Hatchery has had a history of poor water quality. To alleviate this situation, two test wells were driven to locate a better source of water. A much improved source was located at approximately 65 feet. The Roger Reed State Fish Hatchery's office/hatch house has been re-shingled as was the larger brooder house located at the Ayer State Game Farm.

Installations and Residences

Mitigation of the gas tank leak at Southeast Wildlife District office continues. Additional groundwater testing has been completed. Division personnel have met with D.E.Q.E. regarding the necessary remedial actions needed to remove the contamination from the soil and groundwater. Much of this remedial work will take place during FY '89 and '90. D.E.Q.E. notified the Division of hazardous material located at the Petersen Farm in West Bridgewater, where open bags of arsenic of lead lay exposed to the elements. All contaminated material has been placed in special containers for disposal. The Richard Cronin Field Headquarters has been spruced up as students from Assabet Valley Regional Vocational School painted the interior of the building.

A new boiler was installed at the Western District residence. The

Planning and Maintenance Staff
Stephen Henry, *Chief*
Raymond Wheeler

FEDERAL AID PROGRAM

R. Stewart McCaig
Coordinator

During FY '88 the Federal Aid Coordinator continued to expedite flow of federal funds into Division projects. On July 1, 1987, the status of these funds encumbered in active projects was $1,525,020 under the Pittman-Robertson Program, $1,327,975 (shared by Division of Marine Fisheries and Division of Fisheries and Wildlife) under the Dingell-Johnson program, and $18,400 under the Endangered Species Program for a total $2,871,395 actively in use to fund state/federal projects as of the beginning of the fiscal year. In March, 1988, the U.S. Department of the Interior made a final determination of moneys available to the states from excise tax revenues collected during the year which ended September 30, 1987 under the Sport Fish and Wildlife Restoration Acts and notified Massachusetts of entitlement to the following shares:

Pittman-Robertson -	
Wildlife Restoration	464,500
Hunter Education	510,000
Total	974,500
Dingell-Johnson -	1,557,000
Grand Total	$2,531,500

Following provisions of the 1984 Wallop-Breaux amendment, apportionments for sport fish restoration must be shared "equitably" by the Division of Marine Fisheries and Division of Fisheries and Wildlife. The 1988 Endangered Species apportionment, applicable almost entirely to work with the Plymouth red-bellied turtle and the piping plover, was $20,400.

Compliance with federal non-discrimination became an issue during 1987, and Fish and Wildlife Service Region 5 office, administering state finances under the Acts, reiterated state responsibilities to comply with Title VI, Civil Rights Act of 1964 and Section 504, Rehabilitation Act of 1973. Director Cronin designated the Federal Aid Coordinator to serve as liaison with the Region 5 office to implement these Acts. Non-discrimination legislation also received serious attention at the annual Coordinators Conference, held at Lake Placid, New York, in August 1987, and the subject continued to make demands on the Coordinator's time throughout the remainder of the fiscal year.

In November of 1987, the Coordinator submitted results of a test, based on examination of 1985 license stubs, verifying that the number of paid Massachusetts license holders included no duplications; in the spring of 1988, he submitted certification of 96,695 paid hunting licenses and 204,923 fishing licenses. In February, he completed final resolution of requirements from the Region 5 Program Analyst, based on a 1986 audit of Division fiscal years 1981-85.

LEGISLATION

ACTS OF 1988

Chapter 6 - An Act Designating the Field Headquarters of the Division of Fisheries and Wildlife at the Lyman School for Boys in the Town of Westboro as the Richard Cronin Building.

Chapter 294 - An Act Establishing a Procedure for the Disposal of Certain Killed Deer.
This legislation amended Ch. 131, Sect. 72 to change the requirements relative to the display of a deer carcass and added a provision on the disposal of vehicle killed deer. Under this change the carcass only has to be visible from the point of taking to the check station and not at all times as previously required under Sect.72. In addition, Mass. residents may now retain a deer carcass that was killed as a result of a collision with their vehicle.

PERSONNEL REPORT

NEW HIRES

Richard Cannata Laborer, 8/27/87
Mary Cavaliere, Bookkeeper I, 8/27/87
Peter Burns, Asst. Fish Culturist, 8/27/87
Ann Lee, Confidential Secretary, 9/24/87
Juliette Santos, Clerk IV, 9/24/87
Dan McGuiness, Information Officer II, 10/26/87
Alberto Ortiz, Skilled Laborer, 10/26/87
Charles Harris, Laborer, 10/26/87
Robert Janak, Skilled Laborer, 10/26/87
Jack Buckley, Deputy Director/Admin., 11/24/87
Dale Beals, Laborer, 11/24/87
Lawrence Sacazawa, Laborer, 11/24/87
John Sheedy, Asst. Game Culturist, 11/24/87
Lillian Hew, Bookkeeper II, 1/21/88
David Yankus, Laborer, 2/22/88
Susan Langlois, Fish & Game Mgt. Specialist, 3/31/88
Carl Lui, Bookkeeper I, 5/26/88
Yunus Kahlifa, Bookkeeper I, 5/26/88
James Polk, Laborer, 5/26/88

RETIREMENTS

Six staff members retired taking with them 194 years of experience!
They are:

Lewis Schlotterbeck, Deputy Director/Admin., 11/24/87	34 years
Edward Bolduc, Skilled Laborer, 11/24/87	18 years
Lloyd Raymond, Fish Culturist, 12/10/87	40 years
William Pollack, Game Biologist III, 12/31/87	37 years
John Swedberg, Audio Visual Equip. Supervisor, 4/23/88	15 years
John Prouty, Fish Culturist, 8/21/88	50 years

RESIGNATIONS

Robert Tomasian, Skilled Laborer, 8/11/87
Robert Gallagher, Laborer, 8/27/87
Suzanne Timmerman, Bookkeeper I, 8/27/87
Nelson Pratt, Laborer, 8/27/87
Linda Baumgardner, Confidential Secretary, 9/24/87
Marcia Plourde, Accountant I, 11/20/87
Charles Harris, Laborer, 11/20/87
Stephanie Shea, Fish & Game Mgt. Specialist, 2/22/88
David Yankus, Laborer, 5/26/88

PROMOTIONS

Chester Kopinto to Skilled Laborer, 8/27/87
Peter Mirick, to Information Officer II, 10/26/87
Stephanie Shea to Fish & Game Mgt. Specialist, 11/24/87
William Davis to Wildlife Tech. II, 11/24/87
William Minior to Chief of Wildlife Lands, 12/10/87
John Sheedy to Asst. Game Culturist, 1/21/88
Alan Aittaniemi to Fish Culturist, 1/21/88
Eleanor Horwitz to Information Officer III, 1/21/88

TERMINATION

Peter Nelson, Laborer, 5/30/88

TRANSFERS TO STATE POSITIONS

Henry Woolsey, Env. Analyst III, 1/1/88
Scott Melvin, Game Biologist II, 1/1/88
Bruce Sorrie, Env. Analyst I, 1/1/88
Patricia Swain, Env. Analyst I, 1/1/88
Jay Copeland, Planning Assistant, 3/27/88

Financial Staff

Nancy Melito
Assistant Director, Fiscal Affairs

Joanien Brazo*
Mary Cavalieri
Lillian Hew
Francis Ibilli*
Yunus Khalifa
Nancy Limosani
Carl Lui
Marcia Plourde*
Mary Lou Raples
Elizabeth Sienczyk
Ruthann Surrette
Suzanne Timmerman*

*Terminated during Fiscal Year 88

HOW THE SPORTSMEN'S DOLLAR WAS SPENT

CATEGORY	EXPENDITURE	PERCENTAGE
ADMINISTRATION		
Administration	621,348	
Information & Education	305,269	
Subtotal	926,617	12.35
WILDLIFE PROGRAMS		
Game Farm	398,918	
Wildlife Mgt.	911,571	
Wild. Coop.Unit	72,000	
Subtotal	1,373,489	18.30
FISHERIES PROGRAMS		
Hatcheries	975,948	
Fisheries Mgt	831,632	
Fish. Coop.Unit	100,000	
Subtotal	1,907,580	25.43
CONSTRUCTION AT FACILITIES	80,602	1.07
LAND ACQUISITION	101,910	1.36
EQUIPMENT	90,949	1.21
MAGAZINE	84,093	1.12
TRANSFERS TO OTHER ACCOUNTS		
Hunter Safety (Div. Law Enforc't)	179,480	
Shellfish Purification (Div. M. Fish.)*	36,604	
Subtotal	216,084	2.88
SPLIT FUND ACCOUNT		
Nat. Heritage	66,507	
Law Enforcement	971,914	
EOEA	85,775	
Subtotal	1,124,196	14.98
OTHER ASSESSMENTS		
Retirement (.2%)	491,146	
Interest on Debt	50,000	
Notes & Bonds	9,199	
Subtotal	550,345	7.34
TRANSFERS FROM FUND		
Group Ins.	313,416	
Fringe Benefits	242,348	
Subtotal	555,764	7.41
FY 87 Cross Year Transactions	363,000	4.84
Encumbrance Reserve	128,083	1.71
TOTAL EXPENDITURES	**7,502,712**	**100**

* Revenues & expenditures in this account were inadvertently included in the Inland Fish and Game Fund by the State Comptroller.

APPROPRIATION AND EXPENDITURES

INLAND FISH AND GAME FUND
July 1,1987 to June 30,1988

APPROPRIATIONS:

Activity	Appropriation	Encumbered	Expenditure	Reversion
Administration	972,265	25,039	926,617	20,609
Land Acquisition	421,145	205,728	101,910	113,507
Equipment	200,000	88,970	90,949	20,081
Management.	3,623,672	255,614	3,281,069	86,989
Total	5,217,082	575,351	4,400,545	241,186

CONTINUING APPROPRIATIONS:

Activity	Appropriation	Encumbered	Expenditure	Bal.Forward
Development	130,841	25,358	80,602	24,881

RETAINED REVENUE:

Activity	Appropriation	Encumbered	Expenditure	Bal. Forward
Magazine	209,524	32,897	84,093	92,552

FUND SPLIT:

Activity	Appropriation	Encumbered	Expenditure	Reversion
NHESP*	70,500		66,507	3,993

GENERAL FUND:

Activity	Appropriation	Encumbered	Expenditure	Reversion
Acid Rain Pro.	355,920	21,399	116,545	3,056
Acid Rain Res.	709	0	0	709
Total	356,629	21,399	116,545	3,765

CAPITAL OUTLAY:

Activity	Appropriation	Expenditure	Bal.Forward
Building Demolition	15,000	0	15,000
Hatchery Reconstruction	429,000	36,307	383,693
Fuel Tank Removal(Statewide)	79,000	0	79,000
Land Acquisition(Cold wtr.str)	3,526,452	1,392,500	2,133,952
Associated Costs(8840)	221,146	36,688	184,458
Land Acquisition(Adj. Lands)	5,526,273	672,278	4,853,995
Associated Costs(8842)	407,304	117,325	289,978
Fuel Tank Removal(Bourne)	187,225	46,392	140,833
Toxic Substances Removal	13,000	0	13,000
Photovoltaic Project	14,390	0	14,390
Total	10,418,790	2,301,490	8,108,299

FEDERAL GRANTS:

Activity	Appropriation	Expenditure	Bal.Forward
Whetstone Brook Project	116,321	116,321	0

NONGAME WILDLIFE FUND ACCOUNTS:

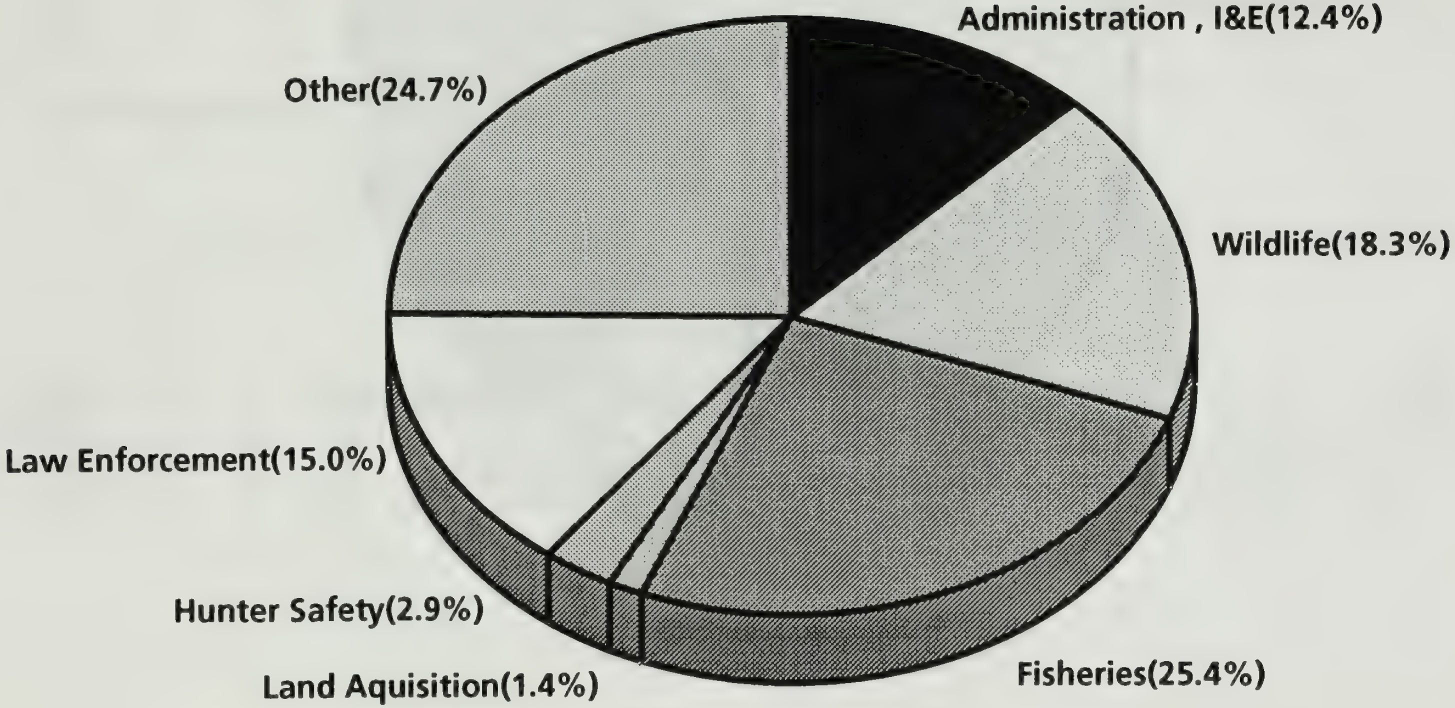
Activity	Appropriation	Expenditure	Reversion
Administration	361,627	273,366	88,261
NHESP*	70,127	66,507	3,993
Total	431,754	339,873	92,254

TRUST FUND ACCOUNTS:

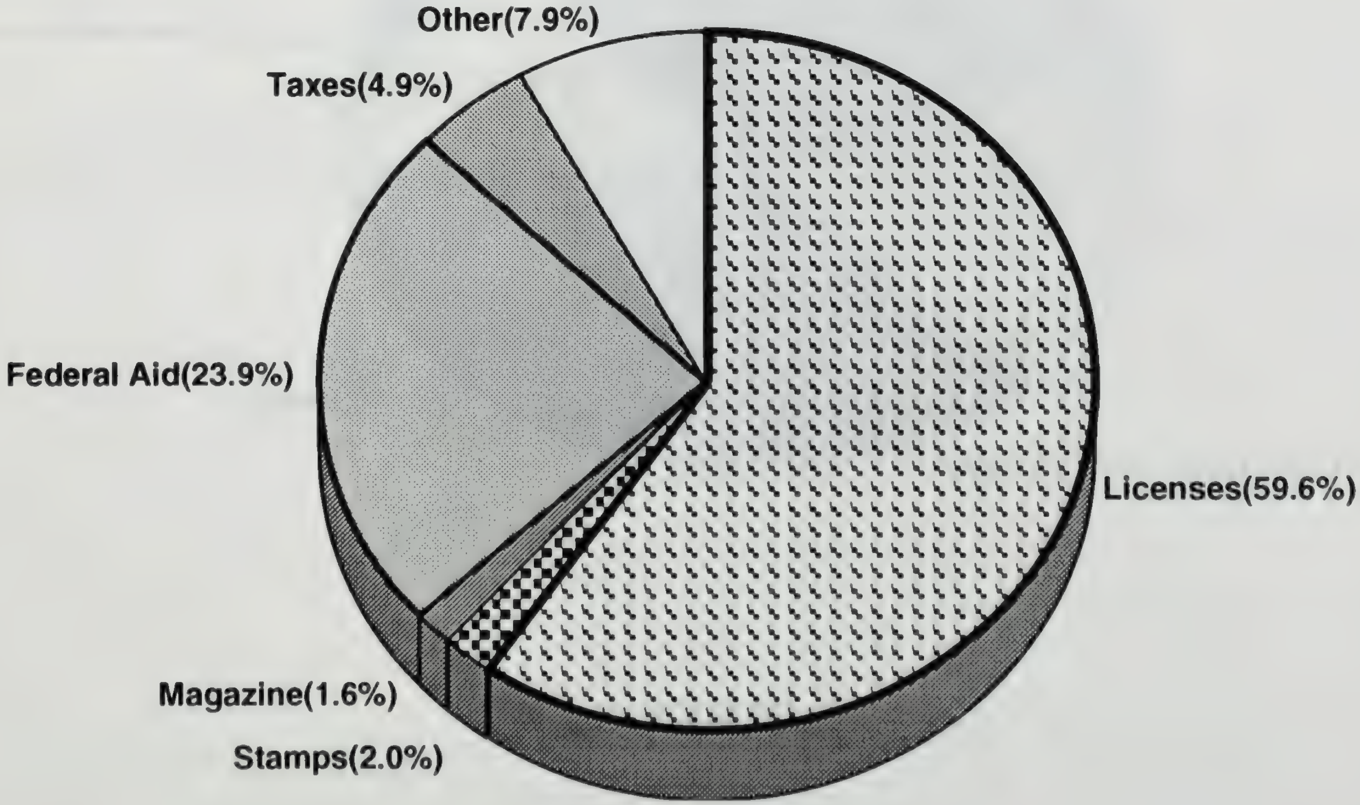
Activity	Appropriation	Expenditure	Reversion
Bald Eagle II	358	330	28
Bald Eagle III	2,000	924	1,076
Total	2,358	1,254	1,104

* 50% Inland Fish and Game Fund
50% Nongame Wildlife Fund

Expenditures



Income


Other(7.9%)
Taxes(4.9%)
Federal Aid(23.9%)
Licenses(59.6%)
Magazine(1.6%)
Stamps(2.0%)

SUMMARY
REVENUE, OTHER FINANCING SOURCES, REVERSIONS
INLAND FISH AND GAME FUND
July 1,1987 to June 30,1988

COLLECTED BY AGENCY	AMOUNT
Fishing, Hunting & Trapping Licenses	4,897,568.80
Archery Stamps	129,090.60
Trap Registration	1,444.00
Waterfowl Stamps	19,462.25
Waterfowl Stamps/DU	21,644.20
Special Licenses, Tags & Posters	16,306.00
Antlerless Deer Permits	49,651.00
Bear Permits	5,162.00
Turkey Permits	44,589.00
Rents	36,262.38
Sales, Other	39,891.70
Misc. Income	4,928.04
Magazine Subscript.	136,559.80
Shellfish Purification*	83,446.50
Fuertes Prints	11,287.50
Subtotal	**5,497,293.77**
COLLECTED BY STATE TREASURER	
Fines and Penalties	46,994.55
Interest	1,232.00
Subtotal	**48,226.55**
FEDERAL AID	
Pittman-Robertson	887,520.87
Dingell-Johnson	651,419.71
Anadromous Fish	605.87
Endangered Species	7,221.76
Indirect Cost Reimbursement	456,993.56
Subtotal	**2,003,761.77**
TAXES	
Gasoline Tax	411,000.00
TOTAL REVENUE:	**7,960,282.09**
TRANSFERS FROM GENERAL FUND	
Reimbursement/Half Price Licenses	61,000.00
REVERSIONS	
Accounts Payable	970,000.00
TOTAL OTHER FINANCIAL SOURCES	**1,031,000.00**
TOTAL REVENUE AND OTHER SOURCES	**8,991,282.09**
FUND EQUITY AS OF JUNE 30,1988	2,638,000.00

SUMMARY OF LICENSE SALES
FY 1988

TYPE LICENSE	UNIT PRICE	QUANTITY	AMOUNT
Res. Cit. Fishing	$ 12.50	201,808	2,522,600.00
Res. Cit. Minor Fish	$ 6.50	9,781	63,576.50
Res. Cit. Fish (65-69)	$ 6.25	7,835	48,968.75
Res. Cit. Fish (Blind-Para)	FREE	3,739	N/A
Res. Alien Fishing	$ 14.50	2,204	31,958.00
Non-Res Cit/Alien Fishing	$ 17.50	10,716	187,530.00
Non-Res Cit/Alien Fish (7 day)	$ 11.50	3,205	36,857.50
Res. Cit. Trapping	$ 20.50	681	13,960.50
Res. Cit. Trap Minor	$ 8.50	53	450.50
Res.Cit. Trappin (65-69)	$ 10.25	45	461.25
Non-Res Trapping	$ 300.00	3	900.00
Duplicate Fishing	$ 2.00	1,575	3,150.00
Duplicate Trapping	$ 2.00	16	32.00
Res. Cit. Hunting	$ 12.50	41,551	519,387.50
Res. Cit. Hunting (65-69)	$ 6.25	630	3,937.50
Res. Cit. Hunting (Para)	FREE	205	N/A
Res. Alien Hunting	$ 19.50	1,088	21,216.00
Non-Res.Cit./Alien Big Game	$ 48.50	1,603	77,745.50
Non-Res.Cit./Alien Sm. Game	$ 23.50	1,395	32,782.50
Non-Res.Cit./Alien Comm. Sh. Pres. (3 day)	$ 19.50	372	7,254.00
Res. Cit. Sporting	$ 19.50	72,077	1,405,501.50
Res. Cit.Sporting (65-69)	$ 9.75	3,403	33,179.25
Res.Cit. Sporting (Over 70)	FREE	23,827	N/A
Duplicate Hunting	$ 2.00	524	1,048.00
Duplicate Sporting	$ 2.00	1,971	3,942.00
TOTAL LICENSE SALES		**390,307.00**	**$5,016,438.75**
Archery/Primitive Firearms Stamp	$ 5.10	25,306	129,060.60
Waterfowl Stamp	$ 1.25	24,654	30,817.50
Sales to Collectors (A/P stamps)			30.00
Sales to Collectors (W stamps)			14,192.50
TOTAL STAMP SALES			**174,100.60**
Collection of Bad Debts			555.75
Trap Registration*			1,444.00
Fees Retained by Clerks			(119,455.70)
Fees Retained by Clerks			(3903.55)
TOTAL NET LICENSE & STAMP SALES			**5,069,179.85**

* Initial: 94 @ $4 $ 376.00
Renewals: 356 @ $3 $1,068.00 Total: $ 1,444.00

SPECIAL LICENSES, TAGS AND POSTERS

July 1,1987 to June 30,1988

Type of License	Quantity	Unit Price	Amount
FUR BUYERS			
Resident	18	25	450.00
Non-Resident	7	75	525.00
TAXIDERMIST	104	20	2,080.00
PROPAGATORS			
Special	56	1	56.00
Class 1			
Initial 21	15	315.00	
Renewal	124	10	1,240.00
Class 3			
Initial 24	15	360.00	
Renewal	100	10	1,000.00
Class 4			
Initial 23	15	345.00	
Renewal	334	10	3,340.00
Class 6			
Initial 11	15	165.00	
Renewal	25	10	250.00
Add. Stores	220	5	1,100.00
Class 7			
Initial 2	5	10.00	
Renewal	19	2	38.00
Importation Permits			
Fish 7	7.5	52.50	
Birds 109	7.5	817.50	
Class 9			
Masters	7	25	175.00
Apprentices	12	25	300.00
General	17	25	425.00
Class 10			
Raptor Breeding	6	10	60.00
Class 11			
Raptor Salvage	27	1	27.00
SHINERS	76	10	760.0
FIELD TRIAL	34	15	510.00
EELS	5	25	125.00
QUAIL FOR DOG TRAINING			
Initial 5	7.5	37.50	
Renewal	11	5	55.00
SHOOTING PRESERVE	7	50	350.00
MOUNTING PERMIT	4	2	8.00
SPEC.FIELD TRIAL PERMIT	8	15	120.00
TAGS & POSTERS			
Game Tags	6,935	.10	693.50
Fish Tags	10,320	.05	516.00
TOTAL			**16,306.00**

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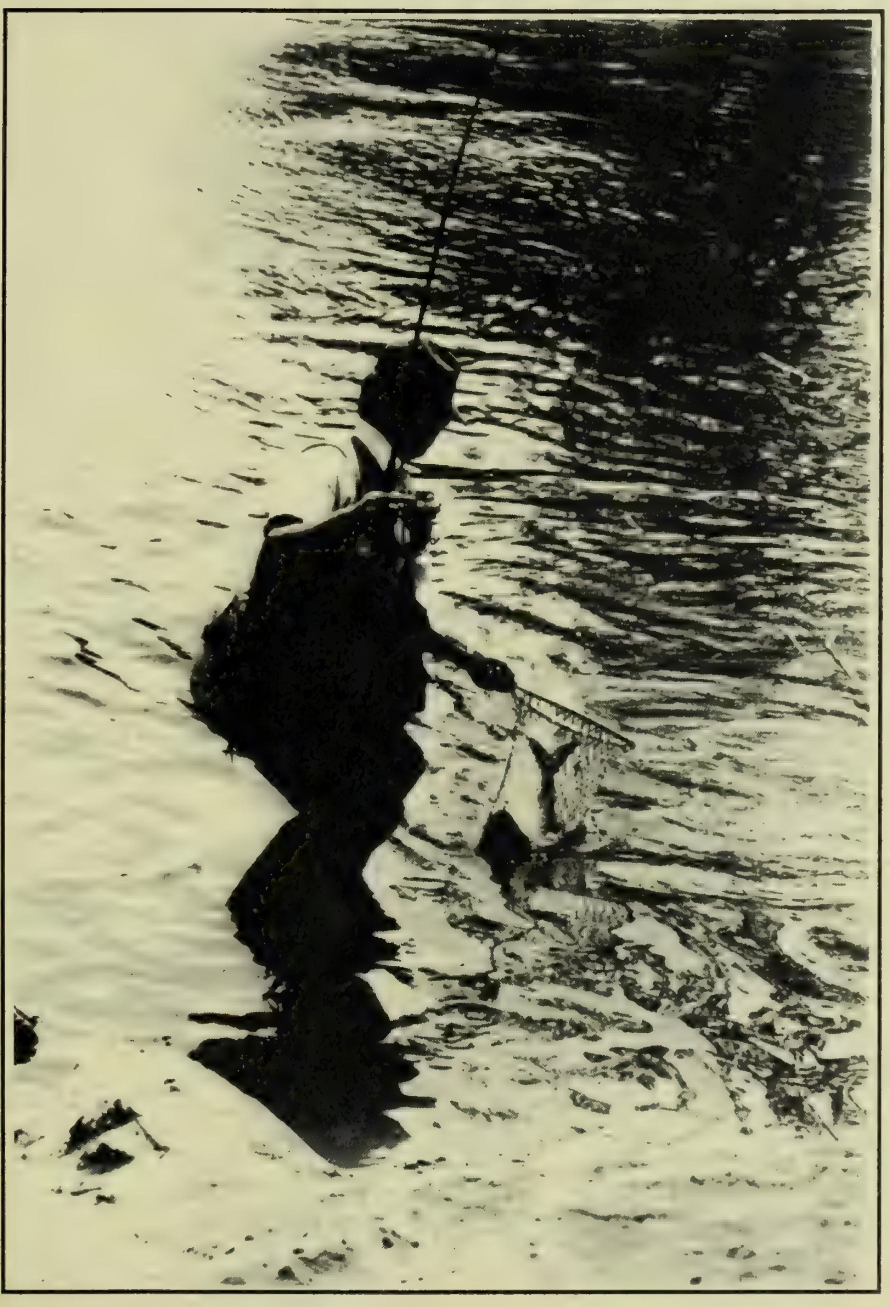
Annual Report 1989

State Library of Massachusetts
State House, Boston



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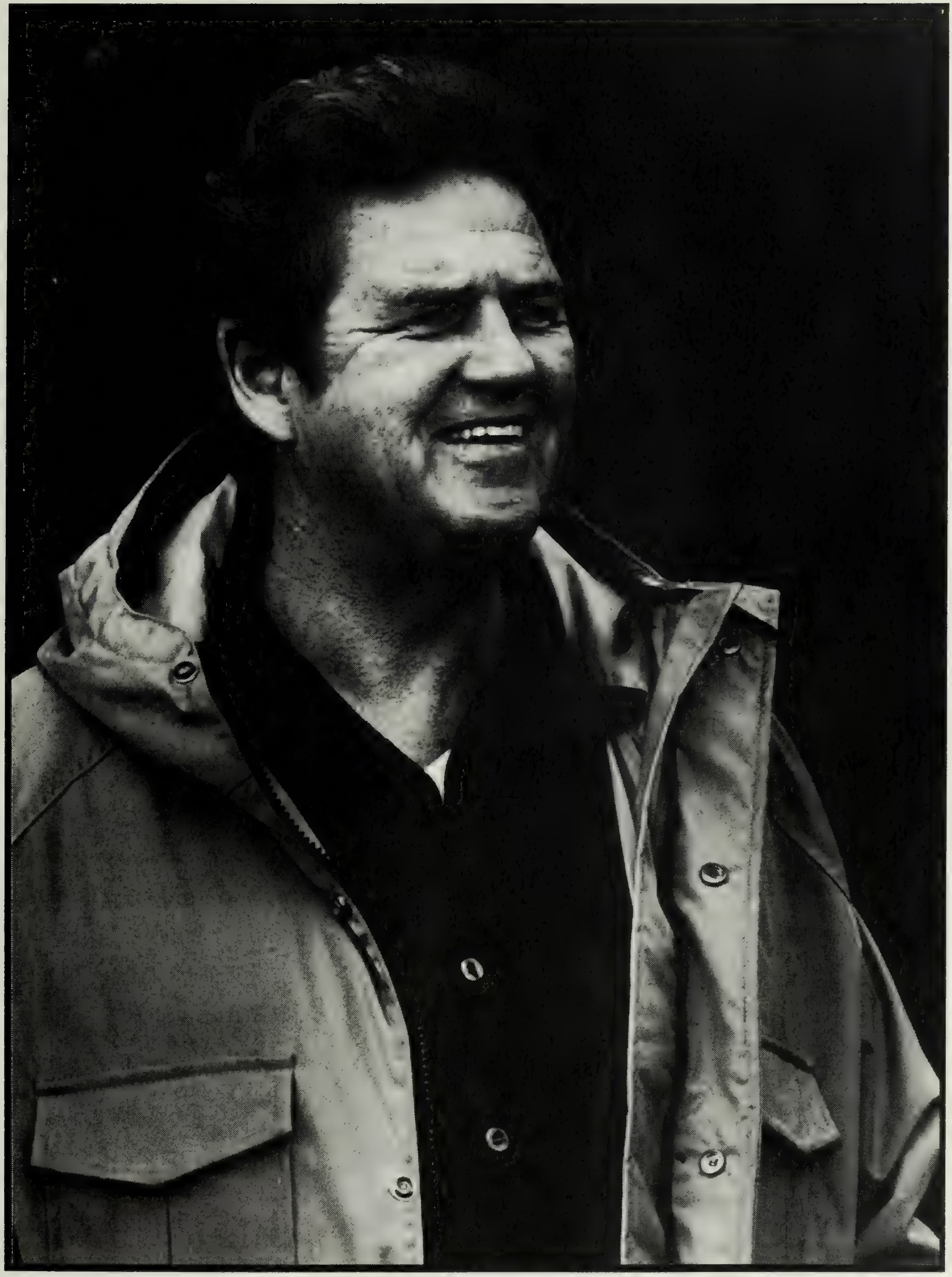
Massachusetts

Division of Fisheries & Wildlife



In Memoriam

Richard Cronin

September 12, 1926 - July 24, 1988

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THE BOARD REPORTS

George Darey
Chairman

The Massachusetts Fisheries and Wildlife Board is a group of seven persons, selected on a regional basis for their demonstrated interest in wildlife. Two members represent specific areas of expertise: wildlife biology and nongame wildlife. Each member is appointed by the Governor to a five year term. The Board oversees operations of the Division of Fisheries and Wildlife, reviews programs and sets policy and regulations pertinent to wildlife in the Commonwealth.

During this fiscal year the Board continued to hold monthly meetings at locations around the state, hold public hearings on proposed regulatory changes and address issues of specific concern. While some issues were of particular concern to the Board — most notably the budget and the decline in Division staff from 154 in 1980 to 129 today — the search to find a qualified replacement for Director Richard Cronin, who passed away on July 24, was the most immediate priority. The loss of Dick Cronin — a good friend and colleague whose extraordinary skills as an orator and administrator were known and respected by professional wildlife managers throughout North America — was a terrible blow to the Division.

A special public meeting was held in August to establish guidelines and procedures for the selection of a new Director, and following an extensive nationwide search and a review of dozens of applications, the Board voted to appoint Wayne MacCallum, Assistant Director of Wildlife, to the position of Director. Mr. MacCallum, who served as Acting Director from July through April, had qualifications and experience which placed him well above all other applicants, and we believe he will serve the Division with exemplary dedication and distinction.

While the task of finding a new Director was of the utmost priority, most of the Board's time was spent in scrutiny and review of Division programs and proposals for regulatory changes. Among the items examined were:

Deer Management: The Board reviewed the existing deer season regulations and considered certain proposals which had been submitted to them including:

- allowing the use of rifled caplocks during the primitive firearms season (accepted)
- changing the regulations with respect to transportation and display of deer carcasses (accepted)
- changing opening day of the shotgun season (rejected)
- establishing procedures for the salvage of vehicle killed deer or any deer killed by means other than sport hunting (accepted)

The Board also considered and approved the number of antlerless deer permits to be issued for the 1989 hunting season.

Bear Management: The Board reviewed the situation of black bears in the Commonwealth, with particular attention to complaints received about depredations by bears, and considered certain proposals which had been submitted to them including:

- changing opening day of the September segment of the bear hunting season to the second Monday of the month (accepted)
- instituting a two-part, detachable bear tag (accepted)
- changing the regulations with respect to transportation and display of bear carcasses (accepted)

Wild Turkey Management: Following a review of the status of the wild turkey population in Massachusetts and a Public Hearing on the matter, the Board voted to establish a six day fall turkey season with a hunting zone covering all areas of the state west of the Connecticut River. The annual turkey bag limit was raised to two, allowing hunters to take one bearded male during the spring season, as well one bird of either sex during the fall season. The Board also voted to extend the open spring turkey hunting zone.

Wildlife Rehabilitation/Problem Animal Control: The Board reviewed regulations pertinent to wildlife rehabilitation and problem animal control and voted to adopt new regulations governing these activities. The primary changes are that (1) a passing grade on a proficiency exam will be required of anyone requesting a permit to conduct these activities, and (2) such persons will be required to be periodically re-certified by attending a conference at least once every three years. There were also changes in the regulations regarding the release of rehabilitated wildlife and the inspection of rehabilitation facilities.

Rare and Endangered Species: Acting on the recommendation of the Nongame Advisory Committee, the Board voted to accept amendments to the list of endangered, threatened and special concern plants. Also in conjunction with the Nongame Advisory Committee, the Board voted to release a memorandum to the U.S. Fish and Wildlife Service urging establishment of an Eskimo Curlew Recovery Team.

Personnel Actions: As overseer of the operations of the Division of Fisheries and Wildlife, the Board votes confirmation of hirings, promotions, retirements and other personnel actions within the Division. During the year they presided over 4 new hires, 8 promotions, 1 retirement and 3 leavings due to Certification Lists. Noteworthy during this fiscal year was the promotion of Dr. Steven Williams, Wildlife Biologist II, to the position of Assistant Director of Wildlife Research. He replaces Wayne MacCallum, the new Director.

Other Activities: In the course of reviewing Division projects and programs the Board addressed numerous other issues and regulatory changes including Division response to fish kills, wording changes on licenses, changes in Wildlife Management Area rules and regulations, archery regulations, deer salvage and hunting hours. The Board also set waterfowl seasons and bag limits within the federal framework during a public waterfowl hearing. Finally, the Board spent considerable time reviewing the rules and regulations relative to the trapping of furbearers, with particular emphasis on the soft-catch trap. Public hearings have and will be held on the subject before any votes are taken on proposed changes in furbearer regulations.

Massachusetts Fisheries and Wildlife Board:

George L. Darey, Lenox, *Chairman*
Nancy Begin, Topsfield, *Vice Chairman*
John F. Creedon, Brockton, *Secretary*
Colton F. Bridges, Grafton
Dr. Gwilym S. Jones, Framingham
Michael P. Roche, Orange
Raymond W. Whitaker, Winchendon

Administration

Wayne F. MacCallum
Director

John Buckley
Deputy Director
Administration

Carl S. Prescott
Deputy Director
Field Operations

WILDLIFE

Dr. Steven Williams
Assistant Director

The wildlife Section oversees research and management of all avian and mammalian species which are utilized in any way for sporting purposes. The Section has a staff of nine biologists and technicians who conduct projects throughout the state assisted by District personnel and working in close cooperation with the U.S. Fish and Wildlife Service and with the Masachusetts Cooperative Wildlife Research Unit.

Migratory Bird Studies

Mourning Dove Census:

The number of calling doves on three long-term survey routes decreased 11 percent from 1988 to 1989. Counts on eight comparable routes increased one percent (100 to 101) from 1988 to 1989 indicating that populations are probably stable throughout the southeastern portions of the state.

Woodcock Census:

Thirteen randomized spring singing ground surveys were conducted in 1989. Survey results showed a 26.1 percent decrease from 1988 in Massachusetts and a 3.5 percent decrease in the Eastern Region of the United States. This decline may be the result of weather conditions and loss of habitat.

Waterfowl Inventory and Nest Studies:

Banding of waterfowl allows us to trace movements, assess hunting pressure and determine survival rates of various species. Although winter banding of black ducks has been discontinued, preseason banding remains an important part of the waterfowl research project. Banding began with spring nest trapping of female wood ducks, continued through the summer and fall with bait trapping and finally, airboat nightlighting with the arrival of the new airboat. We banded a total of 291 wood ducks, 44 mallards, 12 black ducks, 2 mallard x black hybrids, 21 green-winged and 1 blue-winged teal and 3 hooded mergansers. Strong banding efforts were also made by both the Great Meadows and Parker River National Wildlife refuges, to bring the state's waterfowl banding totals to over 1500 ducks.

In addition to trapping ducks, the Division conducted a second year of Canada goose banding round-ups. These round-ups, which occur when adult geese are molting and flightless and goslings aren't feathered out yet, are conducted in late June through mid-July. This year the Division covered 17 sites across the state and banded 1,289 geese. The bandings will allow our biologists to evaluate the effectivenss of our experimental late goose season which is designed to harvest resident birds. As another part of that study, we monitor goose migration throughout the fall and winter, checking goose flocks for neck collared birds. Through this monitoring we have learned that southbound migrants have passed through the state by early January and that some Massachusetts resident birds winter in New Jersey.

During this year Massachusetts conducted its second experimental late goose season. Conditions were less than ideal with mild temperatures and no snow cover inland to force geese to the coast. Permit applications were down almost 800 from last year with 2,703 permits issued and 1,840 geese harvested by 640 of the 1,452 hunters who actually went out during the late season. The late season was restricted to the coastal waterfowl zone. Because complaints about nuisance geese occur throughout the state, we will have to monitor the harvest to determine if a season restricted to the coast is, in fact, effective in controlling growing populations of resident geese.

During the first week of January, the Division conducted its annual mid-winter waterfowl inventory in coordination with all the states in the Atlantic flyway. The weather preceding the flights was mild and there was little ice on coastal waters. Waterfowl counts were predictably low, with only 99,700 birds counted. Mallard, bufflehead and canvasback numbers were above average, black duck, Canada goose and brant counts were average, while mergansers, scaup, goldeneye and sea ducks were below average. These annual inventories are especially important for monitoring populations of waterfowl such as black ducks and sea ducks that are not easily surveyed on their breeding grounds.

Wood duck nesting studies continued during the spring of 1989. Rainfall was above average from April through July and some flooding of nest boxes occurred. There were 352 wood duck nest starts in 655 boxes on our 50 study areas and 258 of the nests produced young. The three year study of back to back nest boxes versus single boxes reveals that wood ducks averaged 82% use of the double boxes with a 75% success rate as compared to a 78% use rate for single boxes and a 69% success rate. We also experimented with a new type of wooden box which we hope will encourage wood ducks to use areas that presently have little or no wood duck use. The experimental boxes had a 59% use rate versus 36% for the control boxes, but the success rate in the experimentals was only 77%, as opposed to 92% for the control boxes. Additional years of data should shed further light on the suitability of the new style boxes.

The 1988 breeding waterfowl pilot study determined that ground checks of 1 km.^{2} plots was a feasible method of indexing waterfowl breeding populations in the Atlantic flyway. Therefore, in 1989, states from Virginia north through New Hampshire checked 1,333 plots for waterfowl as part of a three year base line study. At the end of the three year period, we will have an estimate of the number of mallards, black ducks, wood ducks and Canada geese breeding in the Atlantic flyway. Until now, management plans for the Atlantic flyway have been tied to the plans for the prairies states and have been based on breeding surveys conducted in the prairies. The new information will allow development of management plans for the Atlantic flyway independent of breeding surveys presently restricted to the prairies.

Wild Turkey

The tenth Massachusetts spring gobbler hunt was held in May, 1989, with the season divided into a one-week first segment and a two-week second segment. The open zone and the number of permits was the same as in 1988. A total of 6,259 permit applications were received for the first period and 6,194 for the second period. A record kill of 780 turkeys was attained, with an overall success rate of 6.3 percent. The Berkshire county harvest was 396 (50.1%) with Franklin (154) second and Hampshire (89) third. Adult males comprised 421 (54.0%) of the take.

Restoration efforts continued in 1988; however, winter trapping was hindered by the lack of snow cover. A total of 18 turkeys (6M, 12F) were captured and moved to Camp Edwards Army Base in Barnstable County.

During this period the Staff recommended that a one-week either-sex fall hunting season be instituted. Following approval of this recommendation by the Fisheries and Wildlife Board, regulations were revised to provide for such a season beginning in 1990 and also to expand the open zone for spring 1990.

Falconry

At this point, the Division has licensed 9 apprentice falconers, 15 general falconers and 8 master falconers. In addition, the Division has issued 7 raptor propagation permits and 29 raptor salvage permits.

Black Bear

A record number of bear hunting permits (1,373) were issued for the 1988 hunting season. Thirty seven bear were taken during the two-week split season: 35 during the first segment and two during the second segment. Nineteen males and 18 females were taken in Berkshire

(8), Franklin (10), Hampden (4), and Hampshire (15) counties. Five road kills, three depredation kills, one illegal kill, and one sick bear (later euthanized) were recorded. A total of 35 bear complaints were received. These calls related primarily to beehive damage (16) and trash raiding (10). The dates of the September segment of the season were moved forward two weeks commencing in 1989 to address concerns regarding bear depredation in agricultural areas.

Furbearer Management

The furbearer management program in Massachusetts uses hunting and trapping as management tools in the regulated harvest of renewable resources in the Commonwealth. The combination of these two techniques is used to:

(1) Control problem animals

(2) Reduce habitat degradation

(3) Reduce crop and property damage

(4) Reduce depredations on livestock

(5) Reduce interspecific competition

(6) Indirectly reduce occurrence and severity of disease outbreaks in animal populations, and minimize possible transmission of these diseases to domestic animals and humans

(7) Provide recreational and economic opportunity to people in the Commonwealth.

Many other wildlife management techniques are employed in the management of the state's furbearer resources.

Beaver Harvest Review:

Beaver management is conducted on an aggregate of various watersheds delineated into beaver and otter management zones. During the 1988-89 season, November 15, 1988 - February 29, 1989, 1,069 beaver were taken. The geographic distribution of the beaver harvest remained consistent with past harvest trends. There continues to be an increase in the number of beaver complaints statewide. The Division received 171 beaver complaints in 1989-90 with the majority coming from the western portion of the state.

The practice of relocating problem beaver has been discontinued. Beaver now occupy all suitable habitat in the state. The relocation of beaver originally had a two fold objective:

(1) to facilitate the range expansion of beaver in the state

(2) to provide relief to landowners who incurred beaver damage.

A brochure is currently being prepared to explain the options to landowners who are experiencing beaver damage. The brochure will explain the positive and negative aspects of beaver activities. Landowners will be encouraged, where applicable, to install beaver pipes and other flow devices that will minimize flooding while allowing the beaver to remain.

Bobcat:

Bobcats are sought by hunters, trappers and photographers. A total of 21 bobcats (9 male, 12 female) were taken during the 1988-89 hunting and trapping seasons.

Coyote:

Coyote populations continue to increase in Massachusetts. Growing numbers of sightings and depredation on domestic animals in Worcester, Middlesex and Barnstable counties attest to this animal's adaptability to urban/suburban situations. The number of coyote complaints statewide continues to increase. A total of 64 coyotes were taken during the hunting season; this figure follows the harvest trend of coyotes over the past seven years. Hunters are required to submit harvested coyotes for biological analysis. Through a cooperative program with Northeastern University, which analyses the coyotes, the Division is gaining valuable information for coyote management in the state.

Fisher:

Fisher are harvested during a 30 day trapping season. Two hundred forty eight fisher were taken from western, central and northeastern areas of the state. Trappers were required to submit the heads of fisher for biological analysis. This analysis will allow us to determine the age structure of the population.

Otter:

Trappers harvested 114 otter during the 1988-89 season which ran for 45 days from November 1 through December 15. Otter management data is collected on a watershed basis and carcasses of otter analyzed to evaluate such biological parameters as concentrations of heavy metals and PCB's.

Furbuyer Reports:

Individuals purchasing pelts of animals must obtain a license from the Division and furbuyers are required to report the numbers and species of pelts that they purchase each year. In 1988-89, 24 licensed furbuyers submitted annual reports listing muskrat, beaver, mink, otter, raccoon, red fox, gray fox, opossum, bobcat, fisher, coyote and deer hides as pelts received. These pelts are typically used in making garments and other consumer products.

White-Tailed Deer

Division biologists were involved in research, management and educational activities that reached many citizens of the Commonwealth and led to better understanding and control of the state's estimated 45,000 deer.

The major research effort was aimed at analyzing herd growth and conditions across the state. During the 1988 deer hunting seasons, approximately 70,000 hunters harvested 5,427 deer. Division staff collected biological data on almost 40 percent of the deer taken. Yearling male antler beam diameter measurements and deer weights indicated that the increasing herd size has not affected the good condition of the deer and their range.

In an effort to better understand deer population dynamics, the deer project leader developed a computer-based population model. This model is currently being tested by biologists and managers throughout the Northeast. Following testing and modification, the model will be used as a management tool that will provide objective analysis of deer populations based on harvest and age data collected during the hunting season. The Division also sponsored a fawn mortality study through the Massachusetts Cooperative Wildlife Research Unit at the University of Massachusetts.

Deer management goals have been established for each of the 14 deer management zones. These goals were developed in order to control deer populations at levels compatible with human needs and desires, as well as ecological conditions within each zone.

The basis of deer management in this state is the control of the harvest of female deer during the shotgun deer season through the antlerless permit system. Approximately 36,000 sportsmen applied for antlerless permits and the Division issued 10,779 permits in 14 deer management zones. The $5.00 permit fee generated over $53,895 toward costs associated with running the deer management program. Archers and primitive firearm hunters contributed another $149,000 to Division programs through the purchase of a stamp that allows them to hunt deer during special seasons. In addition, deer hunters in this state contributed approximately $35 million to the state's economy through purchases associated with hunting (i.e., hunting equipment, transportation, food and lodging).

Forestry

The Division's forestry program has three objectives:

- To build an inventory data base for each wildlife management area (WMA), and establish property boundary lines in the field.

- To use this data to design and carry

out commercial forest cutting operations that improve wildlife habitat on, and human access into, each WMA.

- To determine the response of wildlife populations to forest cutting operations.

Forest inventory was conducted on 1,140 acres of the Peru WMA, in the towns of Peru and Windsor, Massachusetts. The inventory was carried out with the assistance of both the Massachusetts Cooperative Wildlife Research Unit and the Unviersity of Massachusetts Department of Forestry and Wildlife.

Forest cover maps were prepared from inventory data to show variations in tree species composition and age structure. These maps also show the location of wetlands and other environmentally sensitive areas, as well as access routes throughout the WMA.

A total of 11.7 miles of boundary line were established on four sections of the Peru WMA. A total of 8.8 miles of boundary line were marked through the forest where WMA property abutts privately owned land. The remaining 2.9 miles of boundary occurred as road frontage. The physical establishment of boundary lines allows the general public better access into the WMA's.

Commercial forest cutting operations were expanded on a portion of the Hiram Fox WMA in Chester, Massachusetts. $7,300 worth of services were provided in forest site preparation by Gagnon Bros.Logging for establishing red oak regeneration on the WMA. The cutting will help create an interspersion of forest age classes to enhance wildlife habitat on the area.

550,000 board feet of timber, and an additional 1,200 cords of firewood, were cut on the Hiram Fox WMA and exchanged for $40,000 worth of services. The majority of these services ($35,500) involved construction of a public access road. More than a mile of access road has been constructed, and while the road is usually closed to vehicle traffic, it can be opened to allow educational tours and handicapped access into the WMA. The remainder of the contracted services ($4,500) were utilized for site preparation work to create favorable seed bed conditions for regenerating red oak ($4,000) and machine time to prepare for and help carry out a prescribed burn ($500).

A prescribed burn was conducted on a three acre clearcut in the Hiram Fox WMA in April, 1989. This first prescribed burn carried out on Division property succeeded in its objective of knocking back invading hardwood forest to establish a wildlife opening by creating favorable conditions for native herbaceous plants such as raspberries, grasses, sedges and forbs.

An old orchard site of about three acres was revived on a portion of the Hiram Fox WMA as part of a commercial timber sale contract with Sarafin & Sons Logging, awarded in 1988 through a public, competitive bid. The loggers protected existing wild apple, cherry, and oak trees, and cut all other trees within the old orchard area. Stumps of cut hardwood trees were treated with an herbicide to prevent sprouting, which will allow full sunlight to reach threatened apple trees over the coming years.

Additional old orchard sites were located. A total of 80 acres were identified as containing abandoned orchard, but only about 20 of these 80 acres were found to contain sufficient concentrations of living apple trees to warrant release work (cutting of competing hardwood trees, and pruning of apple trees). Access routes were plotted for all orchard sites, and release work will be carried out by District personnel as time and resources allow.

Wildlife population censusing continued on a 600 acre portion of the Hiram Fox WMA for the fourth consecutive year; a ruffed grouse drumming census was conducted in April, 1989, and a breeding songbird census was run in June, 1989. The ruffed grouse population has remained stable and disappointingly low at 1 drumming male per 100 acres, while the number of resident songbird species has increased slightly, primarily in areas that have undergone commercial forest cutting.

Activities planned for FY90 include boundary location and forest inventory on both the Swift River WMA in Belchertown and Ware, and the Quacumquasit WMA in Brookfield, Massachusetts. Commercial timber sales are being considered for the Peru and Quacumquasit WMA's.

Wildlife population census will continue on the Hiram Fox WMA, with special attention to songbird species distribution on uncut as well as on cut portions of the WMA. The uncut areas will be of special interest in light of recently declining populations of neotropical migrant songbirds in eastern North America due primarily to deforestation of tropical rainforests in Central and South America.

Massachusetts Cooperative Wildlife Research Unit

Movements and Mortality of White-tailed Deer Fawns:

Tom Decker — *Investigator*

Movements of radio-collared adult does were monitored for changes in daily movements to indicate birth of fawns. Once such changes were detected, intense ground searches were conducted in fawning habitat. Sixteen fawns were captured, examined and radio-collared. Fawns were then monitored for habitat use, movements and mortalities. One fawn was killed by a coyote, one lost its collar and 14 others were monitored throughout the study period. Habitat maps of the study area were updated. Previously established transects were monitored for predator usage through scat deposition. Biological information on harvested deer was obtained through hunter check stations. Telemetry locations were collated and computerized for further analysis.

Intraspecific Behaviors of Known-Age Black Bears in Massachusetts:

Dave Fuller — *Investigator*

Fifty-one bears aged one year and older were handled during the period July 1986 to June 1989. This included 26 females and 25 males. Four of these bears were legally killed by hunters, three were illegally killed (including one in Vermont), one was legally shot while depredating beehives, one sick bear was euthanized, and one bear died of unknown causes. Two dispersed and are unaccounted for. Eleven of 12 breeding females produced at least one litter, with at least 30 cubs produced. Additional studies are recommended to analyze bear densities, movements, and survival in different habitat types.

River Otter Habitat Use and Movements:

Doug Newman — *Investigator*

Shorelines of various wetlands types in Worcester county were surveyed for otter sign. Sites of otter latrines at 141 sites were flagged and monitored for otter usage. Various habitat variables are measured and assessed to determine if usage of wetlands types or points within a wetland type are being used more often by otters. Determination and identification of important habitat components are being examined. This information will be utilized by biologists for the overall management of otters in the state.

River Otter Contaminant Analysis and Population Dynamics:

John Organ — *Investigator*

The focus of this study is to evaluate mercury and organochlorine in Massachusetts river otters. Otter trappers are required by Division regulation to submit the carcasses of river otter before the pelts can be sealed. Analyses of liver samples from 210 otters suggest that river otter populations in the state do not appear to be at risk singly from either mercury or PCB contamination. Additional data will be collected.

Wildlife Staff

Steven Williams
Assistant Director for Wildlife Research

Robert Bellville
Richard Burrell
James E. Cardoza
Thomas Decker
Thomas Early
Marcia Hartleb
H W Heusmann
John Scanlon
Dr. Steven Williams

Game Farm Staff

Ayer Game Farm

Stephen Foster, *Manager*
Robert Bennett
Mark Brideau
Richard Donohue

Sandwich Game Farm

John Prouty, *Manager*
Jack Almeida
Robert Gallagher
Ernest Green
Kenneth Weaver

FISHERIES

Peter H. Oatis
Assistant Director

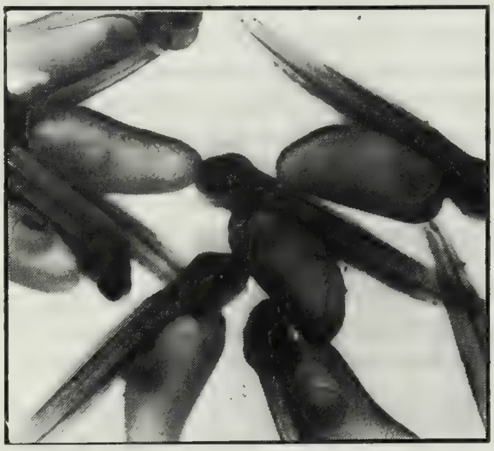
The Commonwealth's aquatic resource inventory includes a variety of fisheries habitat ranging from coldwater, wild trout fisheries to areas suitable for warmwater panfish. There are approximately 2,675 lakes and ponds, totaling about 142,681 surface acres. Most ponds are less than 500 acres in size. The two largest bodies of water, both man-made drinking water supplies, are the Quabbin (25,000 acres) and Wachusett (5,000 acres) Reservoirs. The largest river in Massachusetts is the Connecticut River with 72 miles (7,284 acres) transecting the Commonwealth. The 2,027 named streams flow about 10,704 miles and comprise approximately 14,900 acres. The protection, management and enhancement of these inland fisheries resources and their associated habitats involves several ongoing fisheries projects.

Survey and Inventory

Stream sampling was essentially a continuation of last year's design to quantitatively sample a selected number of previously productive waters found to support significant numbers of fish, primarily native/wild trout populations. Actual fish sampling was based on electrofishing runs. Fishery crews stationed at the district wildlife offices sampled a total of 88 stations on 76 streams statewide. Sample types included routine surveys on 55 stations, multiple electrofishing sampling of 31 stations for fish production estimates, and acid precipitation and stream channelization impact analysis on 3 streams. In addition, for the first time, a fish survey was conducted at 11 stations on 9 streams, as well as a number of ponds, on Martha's Vineyard. This was a joint effort among the Division of Fisheries and Wildlife, Harvard University (Karsten Hartel), University of Massachusetts (Doug Smith), Division of Law Enforcement (Sandy Lucas), Mass. Division of Marine Fisheries (Kevin Johnson) and Trustees of Reservations (Tom Chase).

Anadromous Fish Investigations

In 1989, 108 Atlantic salmon returned to the Connecticut River; up slightly from the 95 salmon tallied in 1988. American shad were abundant in 1989 with more than 350,000 fish lifted over the Holyoke Dam - an increase of approximately 50,000 fish over the previous year's total. Discussion and negotiation with Northeast Utilities regarding the development and installation of downstream fish-passage facilities at Holyoke, Turners Falls and Northfield Mountain were, and continue to be, the dominant topic on anadromous fish restoration efforts on the Connecticut River. As it currently stands, downstream fish-passage facilities are slated to be completed at Holyoke and Turners Falls in 1993 and 1994, respectively. No schedule has yet been set for Northfield Mountain.



Atlantic Salmon sac fry.

Project personnel initiated a major restoration effort to reestablish Atlantic salmon and shad on the Westfield River in 1989. More than 130,000 juvenile salmon were released in the first year and plans are underway to establish fish-passage facilities at the West Springfield dam.

Biologist William Easte is now responsible for overseeing field operations on the Merrimack River Technical Committee, the advisory group to the Policy Committee. Bill noted that 85 adult Atlantic salmon were captured at the Lawrence fish-passage facility in 1989;

up 20 fish over 1988. American shad, however, continued in a downward trend; only 7,875 fish were passed at Lawrence in 1989, down 4,484 fish compared to 1988.

The Amoskeag Fish Passage Facility in Manchester, New Hampshire, was opened in 1989 providing anadromous fish access all the way to Hooksett, New Hampshire. The passage of 15,000 shad at Amoskeag will trigger the development of the next fish-passage facility in Hooksett.

A major activity of the Merrimack River Technical Committee in 1989 was the revision of the "Strategic Plan for the Restoration of Atlantic Salmon to the Merrimack River Basin". The major change in the plan is the conversion of the Nashua Fish Hatchery to a brood stock facility, with the emphasis on fry production, and restoration based on a fry stocking program. Additionally, post-spawning brood stock - which are likely to number between 3,000 to 5,000 fish annually - are being proposed for use in establishing a recreational fishery. The Merrimack River Policy Committee is slated to act on this proposal at the April 5, 1990 meeting.

Acid Rain Investigations

Acid Rain Monitoring Project:

This marked the sixth year of the Acid Rain Monitoring Project which is conducted by volunteers organized, trained and managed by the Massachusetts Water Resources Research Center at the University of Massachusetts. At the end of the second year we had successfully surveyed the entire state. We are presently in the process of sampling approximately 800 sites that represent the full gamut of acidified and buffered waters throughout the state. This monitoring will continue for at least the next ten years and will provide a statistically valid analysis of the long-term trends and rates at which our waters are acidifying. Since its inception this project has demonstrated that Massachusetts is very vulnerable to acidification, with 5.5% of its waters acidified, 16.7% critical and 62% with very little buffering capacity. The data generated by these efforts indicate that the recent national inventory of acidification assessment conducted by the Eastern Lakes Survey Team of the EPA grossly underestimated the state and threat of acidification to Massachusetts waters and is perhaps just as invalid if applied to other sections of the nation. Presently, the information collected during the past five years is being loaded into the statewide graphic information system at the University of Massachusetts. The GIS will provide a great deal of insight in the analysis of long-term trends in surface water sensitivity and the base maps produced will supply base information for research and management decisions.

Whetstone Brook Mitigation Research:

This project is a joint federal/state undertaking and is part of the "National Acid Precipitation Assessment Program" designed to evaluate acidification mitigative strategies. Additional studies in this field are in progress in Tennessee, Minnesota and West Virginia. The collection of two years of base line data relative to the physical, chemical and biological productivity of the stream is now complete. A considerable delay with the initiation of the dosing portion of the project occurred when the manufacturer was unable to deliver the doser on time. Installation of the hydropowered lime dispensing device was completed in November 1988 and actual liming commenced in March of 1989. Assessments of the impact of liming this important, but recently acidified trout stream will be conducted during the next three years.

Technical Assistance:

The amount of time and energy that fisheries staff members spend in providing technical advice and assistance to other agencies, review and advisory boards, special investigation teams and private concerns represents of necessity a markedly increasing and not necessarily controllable work load. Within the past year activities covered by this project included monthly representation at the Pesticide Board, Water Resource Interbasin Transfer Task Force and Acid Rain Aquatic Resource Research Advisory Council meetings; in depth review of numerous development or regulatory proposals encompassing projects such as pipeline crossings of streams; lake diagnostic and feasibility study recommendations to the Division of Water Pollution Control; and commenting upon new regulations pertinent to water quality standards. In addition, DFW entered into a cooperative agreement with other state agencies as the lead agency in the investigation of fish kills. During the period, 23 fish kills occurred; requests for assistance were about equally divided between private and state agencies. The majority of kills occurred in ponds (21); the most active months were April though July. Twenty of the twenty-three kills required field investigations. The number of kills were equally divided among the districts with the exception of the Western District which had only one kill. The average kill involved a few hundred fish; large kills occurred at Chicopee Brook (12,000) in Monson due to a spill of cyanide and cadmium; and 20,800 fish at Arcade Pond in Whitinsville, cause uncertain but believed to be an algae bloom aggravated by excess addition of copper sulfate to control the bloom. In all, an estimated 37,000 fish were killed during the period; 13% game fish. About 90% of the kills were due to natural causes, listed in decreasing order by cause as spawning stress, disease, low dissolved oxygen, algae blooms, drawdowns and acidity. The average time elapsing from when a fish kill was thought to have occurred and when it was reported was 3.34 days.

Quabbin Investigations:

Forty-eight Quabbin lake trout qualified for sportfish award pins in 1989. The ten largest ranged from 14 1/2 to 19 1/2 pounds. The annual Quabbin creel survey revealed that an estimated 31,531 anglers fished 178,060 hours to catch 32,824 fish, primarily lake trout, smallmouth bass, landlocked salmon and white perch. During early May, 30,000 eight-inch landlocked salmon yearlings were stocked from the Roger Reed Salmon Culture Station in Palmer. Presently, 15,400 landlocked salmon from Lake Winnepesaukee, New Hampshire, and another 13,200 from East Grand Lake, Maine, are being reared at Palmer and are due for release into Quabbin in May 1990 as eight-inch yearlings. The two strains will be monitored to compare survival and rate of growth.

The Quabbin Fish Advisory was modified to permit more fish to be safely consumed based on increased information about mercury and methyl mercury levels in different sizes and species of fish. The new advisory permits consumption of certain fish (salmon; lake trout under 24 inches) by anyone for unlimited meals; allows certain fish (white perch and other species) to be consumed by the general public for one meal per week; and prohibits consumption of some kinds of fish (smallmouth bass, largemouth bass; lake trout over 24 inches) by anyone.

Research on the effects of aluminum on Quabbin fish populations continued during this period. The vertical distribution of dissolved aluminum was mapped in the southern end of the reservoir during the height of summer stratification and also during lake trout spawning in the fall. Sonar was used to map the distribution of spawning lake trout in relation to aluminum levels. Data from 1988 was compared to similar data collected in 1987. Biologically significant levels of aluminum occurred at mid depth in the reservoir during summer stratification in both 1987 and 1988, sufficient to impact such sensitive species as rainbow trout (not currently stocked in the reservoir), but not lake trout. There were no significant levels of aluminum at major lake trout spawning sites during either 1987 or 1988 in the fall. Sufficient aluminum exists in bottom sediments to potentially interfere with lake trout production or cause a fish kill if it is remobilized. A remobilization event is possible if the pH in the water column falls below 5.5, and baseline data is being collected with that possibility in mind.

New metals data was collected along shoal areas of Quabbin during the height of smelt spawning. Stream spawning of smelt has been severely impacted by aluminum, and successful reproduction of smelt is now believed to be dependent on shoreline spawning. Metal levels were compared to the degree of wave action, wind speed and direction. Results indicated that out of 17 metals, only aluminum and iron levels in shoal areas throughout the reservoir were elevated during the windy conditions of April when the wind was blowing onshore; low levels occurred when the wind blew offshore. Aluminum levels were well within the range known to cause smelt egg mortality as shown from both laboratory studies and data collected from Quabbin tributaries. Only isolated coves away from direct wave action had low levels of aluminum. The source of the metal is believed to be near-shore bottom sediments stirred up by wave action. The ultimate source of the metals is from acidification of the watershed and large influxes of aluminum from tributaries. At the present pH of the reservoir (6.5) most of this aluminum settles on the bottom. This data indicated that shoal areas of Quabbin are chemically hostile to successful smelt reproduction and that smelt cannot be expected to be a viable long term forage species for the salmonid fisheries in the reservoir as they were during the period from 1960 through the 1980s.

Hatcheries

There are five state facilities which raise fish to: 1) augment natural fish production; 2) restore extirpated native fish species, and 3) reestablish the predator/prey balance. The McLaughlin, Montague, Sunderland and Sandwich hatcheries culture strictly brook, brown and rainbow trout while the Palmer facility is primarily responsible for the production of tiger muskies, northern pike, landlocked salmon and Atlantic salmon. In FY 89, The Division stocked 9,600 pike species into numerous selected state waters to control panfish populations and diversify recreational fishing opportunities as well. In addition, catchable trout were stocked in more that 700 bodies of water. The numbers stocked (all species pooled) totaled 770,212 fish and had a combined weight of 480,059 pounds. Hatchery personnel continue to do outstanding aquaculture. The production figures for each facility are attached.

Fisheries Staff

Peter Oatis
Assistant Director for Fisheries
Joseph Bergin, Aquatic Biologist II
William Easte, Aquatic Biologist I
David Halliwell, Aquatic Biologist II
Richard Keller, Aquatic Biologist II
John Lindenberg, Aquatic Biologist II
Robert Madore, Aquatic Biologist II
Mark Tisa, Aquatic Biologist II

Hatchery Staff

Bitzer Fish Hatchery
Ralph Taylor, *Manager*
Chester Kopinto
John Kopinto
John Williams

McLaughlin Fish Hatchery
James Hahn, *Manager*
Jennifer Ayre
Edward Bolduc
Annette Kucharczik
Albert Leach
John McGurn
William Mikelk
Roscoe Perham III
Joseph Skowron
John Sousa

Sandwich Fish Hatchery
Lloyd Raymond, *Manager*
Alan Aittaniemi
Antone Frenandes, Jr.
Lawrence Hollings
Arthur Leonard
Vernon Lopez
George Moore

Palmer Fish Hatchery
Michael Masley, *Manager*
Robert Lucas
Arthur Pellegri, Jr.

Sunderland Fish Hatchery
Frank Pietryka, *Manager*
John Besse, Jr.
John Gromaski
Douglas Isles
Edward Siwicki
Thomas Smith

PRODUCTION FIGURES
1988 - 1989

Hatchery Species	*1-4*	*6-9*	*9+*	*12+*	*Tot.Fish*	*Weight*
McLaughlin						
Rainbow	-	2,000	27,470	155,200	184,670	168,914
Brook	-	9,000	112,395	-	121,395	45,960
Brown	-	-	84,405	-	84,405	28,393
TOTAL	**-**	**11,000**	**224,270**	**155,200**	**390,470**	**243,267**
Montague						
Rainbow	-	-	22,472	26,250	48,722	46,140
Brook	-	-	13,300	8,050	21,350	14,791
Brown	-	-	-	24,830	24,830	22,077
TOTAL	**-**	**-**	**35,772**	**59,130**	**94,902**	**83,008**
Palmer						
Rainbow	-	-	-	2,150	2,150	1,720
Tiger Muskie	-	-	2,500	-	2,500	250
Landlocked Salmon	12,000	Quabbin 29,515	-	-	41,515	6,315
Salmon fry	24,000	-	-	-	24,000	14
Atlantic Salmon	-	-	-	120	120	720
Northern Pike	-	-	3,500	-	3,500	583
TOTAL	**36,000**	**29,515** **(Quabbin)**	**6,000**	**2,270**	**73,785**	**9,602**
Sunderland						
Rainbow	-	-	-	54,506	54,506	47,373
Brook	-	-	18,900	9,362	28,262	20,489
Brown	-	-	-	27,160	27,160	30,554
TOTAL	**-**	**-**	**18,900**	**91,028**	**109,928**	**98,416**
Sandwich						
Rainbow	-	25,477	-	-	25,477	9,246
Brook	-	6,485	-	1,459	7,944	3,363
Sea-Run Brown	-	19,800	-	-	19,800	4,422
Brown	-	17,806	5,000	25,100	47,906	28,735
TOTAL	**-**	**69,568**	**5,000**	**26,559**	**101,127**	**45,766**
GRAND TOTALS	**36,000**	**110,083**	**289,942**	**334,187**	**770,212**	**480,059**

NATURAL HERITAGE & ENDANGERED SPECIES PROGRAM

Dr. Thomas W. French
Assistant Director

Legislation & Regulations

Program staff sought legal protection for endangered species in the Commonwealth by working towards the passage of a comprehensive state endangered species bill. During the fall of 1988, staff worked on redrafting the previous bill with the result that the refiled bill was notably better than the original. The Endangered Species Protection bill had a very successful hearing on April 6th before the legislature's Joint Committee on Natural Resources & Agriculture with 19 individuals representing federal and state government as well as a variety of conservation organizations testifying in favor of the bill.

Program staff also testified before the Taxation Committee in favor of a bill that adds a Nongame Wildlife Fund voluntary contribution line to the Commonwealth's *corporate* tax forms. The desired result was achieved by incorporating the language authorizing this funding mechanism in the state budget that was passed in early fiscal 1990.

The state's list of Endangered, Threatened, and Special Concern plants (321 CMR 8.01) was reviewed and amended. The revised list, the first major revision in four years, totalled 241 species. The changes included: the deletion of four plant species from the list, the addition to the list of 51 species, status changes for six listed species, and taxonomic changes for three listed species. Fifty plant species, including two of the newly delisted species, that have not been documented in recent decades or whose known locations have been destroyed were placed onto a new non-regulatory historical list.

Personnel

Two staff members, the zoologist and the Program's secretary, left the Program in October for other positions. Because of the state's hiring freeze, the Program was unable to refill either of these two positions. With these two vacancies, Program personnel consisted of seven state positions and two contracted positions. In addition, the Program was aided by about a dozen interns and Work-Study students from area colleges and universities.

Budget

Program revenue consisted primarily of voluntary contributions to the Nongame Wildlife Fund (NGWF) via individual tax forms.

1987 tax year- final tabulation (11/88)	$392,000
1988 tax year- final tabulation (12/89)	$331,000

The contributor rate for tax year 1987 dropped to 2.5% of all tax filers while the average donation was $5.76. Tax year 1987 was the first year of the change on the state income tax form that allows individual filers to ***add*** to their tax (and not only deduct from their refund as had been the case in the first four years of the "checkoff").

Revenue for Program activities was augmented by federal reimbursements under the Federal Endangered Species Act's "Section 6":

Plymouth Red-bellied Turtle	$ 13,000
Piping Plover	$ 6,400
American Burying Beetle	$ 1,000

In addition, the Bank of Boston contributed $10,000 to the Bald Eagle Trust Fund.

The Program's appropriations and expenditures were as follows:

Activity	Appropriated	Expended
Nongame Management (100% NGWF)	$320,000	$283,693
Natural Heritage (50% NGWF / 50% Inland F & G Fund)	$194,000	$174,435

Expenditure of appropriated funds was curtailed by the state hiring freeze and other administrative financial constraints.

Program Promotion, Information, and Education

In a continuing effort to promote contributions to the Nongame Wildlife Fund, the Program produced or sponsored the following:

- CPA Review magazine - produced and placed three 2/3rds page advertisements in the winter edition of this magazine for certified public accountants;

- Sponsored the "World of Survival" nature series on Channel 2 television (WGBH) from January through March;

- 'GBH Magazine - produced and placed a 2/3rds page advertisement that appeared in the February, March and April issues of Channel 2's monthly program guide;

- produced a short television public service announcement featuring footage of an eagle with a sound track of a jet plane that crashes;

- Massachusetts Wildlife magazine - produced and placed a full page advertisement.

For educational purposes, the Program produced a full color poster entitled "Massachusetts Rare Plants: A World of Diversity under our Care" with photographs of fourteen rare plants. Five thousand copies were printed and distributed throughout the state. A number of one page fact sheets on individual rare species continued to be produced as handout materials, as was a fact sheet on vernal pool habitats.

Program staff gave presentations at numerous conferences including: the Northeast Nongame Technical Committee meeting in Saratoga Springs, NY; Massachusetts Audubon Society's Wildlife Futures conference in Bridgewater; meetings of the MA Association of Professional Foresters; MA Mosquito Control Board; MA Wildlife Rehabilitators Conference; and the annual meeting of the Massachusetts Association of Conservation Commissions.

Land Protection

The Program had its best year yet for acquisition of endangered species habitat with a diversity of rare natural community types being protected including crucial parts of two sandplain grasslands; all or parts of four Coastal Plain kettle ponds; a significant portion of a limestone wetland; and a floodplain forest and its adjoining riverine beach. The properties acquired were:

Head of Plains (inholding)	Nantucket	2 acres
Oliver's Pond	Harwich	12 acres
Sly Ponds	Plymouth	92 acres
Jug End Fen	Egremont	42 acres
Rainbow Beach & Forest	Northampton	35 acres
Harlow Pond	Plymouth	14 acres
Katama Plains	Edgartown	18 acres
		Total 315 acres

All but one of these rare and endangered species habitat acquisitions are adjacent to existing public conservation land. Negotiations were handled for the Division of Fisheries & Wildlife by The Nature Conservancy for five of the acquisitions and by the Massachusetts Audubon Society for one acquisition. The total cost of the 315 acres was $2.6 million which came from bond funds. Fiscal year 1989 also saw the first use of eminent domain powers to acquire an endangered species habitat to protect a crucial piece of land that was threatened with development and had title problems.

The Natural Heritage Areas Registry of rare species sites on publicly owned lands continued with an increase in registry activities with towns, especially in the southeastern part of the state. Considerable staff time was also spent on land management activities including involvement with the installation of three gates to protect the new DFW property in Northampton and the installation of gates and a trash clean up at an important town-owned Coastal Plain kettle pond in Barnstable. The Program provided input into the Department of Environmental Management's (DEM) Representative Natural Areas system, an administrative designation that recognizes sensitive natural areas and exemplary natural community types on DEM property.

Environmental Review

The Program continued to be very active in reviewing the impacts of hundreds of proposed projects on rare species and habitats. Several particularly noteworthy projects were reviewed through the Massachusetts Environmental Policy Act (MEPA) including, Independence Park/Hyannis Ponds (ENF & DEIR), Williams College faculty housing (ENF, result - a 5 year moratorium on construction near the rare plants), and Quincy Quarries (EIR waiver, protective fencing to be constructed).

The Program also carried out the first full year of its new responsibilities under the amended Wetlands Protection Act regulations. During the autumn, Program staff made extensive revisions to the Estimated Habitat maps of rare wetlands wildlife based upon updated information in the Program's data base. In early January, these new or revised Estimated Habitat maps were mailed to 143 town conservation commissions in the state. Hundreds of copies of a new revised atlas of all Estimated Habitat maps were produced and distributed. In October, DEM's Division of Forests & Parks adopted a policy that they would consult Estimated Habitat maps when reviewing all forest cutting plans. This is not required under the wetlands act and thus it affords rare wetlands wildlife additional consideration. Four hundred sixty-two Appendix A forms concerning individual wetlands project filings were reviewed by the Natural Heritage & Endangered Species Program this fiscal year. Activity concerning vernal pools escalated: 12 vernal pools were certified by the Program's Wetlands Wildlife Biologist. Educational efforts included cosponsoring vernal pool workshops that were held in Belmont (cosponsored with the Massachusetts Association of Conservation Commissions) and Amherst.

Data Management

A new "site name" field was added to the majority of the data base occurrence records to facilitate the searching and grouping of rare species observations. This new field in the computerized records enables the Program to sort records by biological clusterings in addition to the present fields such as land ownership, watershed, or town name. A number of new occurrence records were added to the data base with a smaller number of updates to previously existing records.

Program staff began experimenting with how data layers extracted from the Program's data base could be incorporated into the state's Geographic Information System.

Inventory, Research & Management

For the fourth year, the Program sponsored a Small Research Contracts program to conduct field inventory and research projects on rare species or natural community types of concern. A total of 24 proposals requesting $30,000 were received. Of these, 17 proposals were approved for $15,277 for the 1989 field season. Highlights of other inventory, research, and management activities are described below.

Natural Communities

Sandplain Grasslands:

The management of one of the state's best sandplain grasslands, Katama Plains, continued in conjunction with The Nature Conservancy, with a prescribed spring burn. During the annual vegetation monitoring of control, mow, and burn plots, it was observed that grassland species had impressive flowering displays, particularly in the burned areas. The monitoring has begun to find seedlings of some of the rare sandplain grassland plant species in the monitoring plots in the burn areas where they had not previously been seen. Discussions continued with the Edgartown Airport Commission over the areas of conflict between the grassland conservation and airport expansion.

Coastal Plain Pond Shores:

With the Division's acquisition of several Coastal Plain kettle pond shore habitats, the designation of others as DEM "Wildlands", recurrence of threats to the particularly fine ponds in Hyannis, and continued development along many important shore habitats, inventory and survey of the pond shore community proceeded with plans for permanent monitoring of the community and its rare plants.

Pitch Pine/Scrub Oak Barrens:

The research by Dr. William Patterson of U.Mass./Amherst into this fire-maintained community at Myles Standish State Forest continued with the burning of a one acre experimental plot. The vegetation monitoring of the burn and cut plots will continue through the summer and will be compared in the final report. Plots for the long term monitoring of the Mashpee Pine Barrens were established by the Program Ecologist. Similar plots will be set up in other pine barren areas. Mapping of the scrub oak/pine barren areas of the Manuel Corellus State Forest on Martha's Vineyard was begun, with a site visit and aerial photographs .

Calcareous Fens:

Monitoring with The Nature Conservancy of one of the major calcareous fens in Berkshire County continued for this important and threatened natural community. Inventory of other possible sites in Berkshire County continued.

Bogs and acidic fens:

Inventory and classification of these peatlands continued in the areas of their main distribution (especially northern Worcester and Middlesex Counties), with some focus on the more southern and eastern variants of the community type.

Atlantic White Cedar Swamps:

Inventory and definition of the subtypes of this community was continued by Glenn Motzkin, a graduate student at U.Mass./Amherst. Several basin and seepage Atlantic White Cedar Swamps were visited by Program staff, including the small swamps in and near the Mashpee Pine Barrens area owned by the Division.

Natural Community Management:

The Program Ecologist attended a course on forest fire control and helped organize and attended a workshop on prescribed burning. The Program provided a trained crew that participated in several prescribed burns for natural community management, including the fire at the Hiram Fox WMA that Division Forester John Scanlon planned for wildlife habitat improvement. Program staff attended advisory meetings of the Plymouth and Essex County Mosquito Control Districts' Open Water Management programs for tidal marsh management. They also performed inspections of several of the National Park Service's National Natural Landmarks (North and South Rivers, Cold River, Hawley Bog, and Fannie Stebbins floodplain forest), and discussed the problems of several others with the National Park Service.

Plants

Sandplain Gerardia (*Agalinis acuta*) became the second Massachusetts native plant to be listed as a federally Endangered species. This listing by the U.S. Fish & Wildlife Service became effective in August,1988.

The Program Botanist developed a list of 50 native plant species which have been known from Massachusetts historically but are not now known to occur in the state.

Extensive botanical inventory and census work continued. A particularly notable botanical find was the discovery of Annual Peanutgrass (*Amphicarpum purshii*) which is the first new plant genus to be discovered in New England since 1935. The Program continued to administer a contract for botanical inventory work in the Cape Cod National Seashore funded by the National Park Service.

Vertebrate Animals

Birds

Bald Eagle: A significant milestone was set this year with the first nesting of Bald Eagles in Massachusetts since about 1905. In the early spring, four territorial pairs were discovered, three at Quabbin Reservoir and one on the Connecticut River just above Turner's Falls. Two of the pairs at Quabbin laid eggs. Three chicks hatched, and all fledged successfully. The three chicks were banded on June 27th, making it possible to monitor their movements and the long-term status of eagle recovery in Massachusetts.

The 1988/89 winter survey was held on January 13, 1989. A total of 44 Bald

Eagles, including 23 adults and 21 immature birds, were seen at seven locations around the state. Thirty of the 44 birds (16 adults and 14 immatures) were seen at Quabbin Reservoir. In addition, one golden Eagle was sighted at Quabbin. Since the Division's request to purchase helicopter flight time to survey the Reservoir was denied, the Division was fortunate in finding WNEV-TV willing to donate flight time on their helicopter to accomplish this survey.

Peregrine Falcon: The establishment of a second nesting pair this year set another milestone in the reintroduction of Peregrine Falcons to the state. The new pair nested in Springfield in a nest-tray provided on a twenty-first floor window ledge of the Monarch Place Building. Of four eggs laid, two hatched and both fledged successfully, but not before one chick had been rescued from the nest ledge so that a piece of meat could be dislodged from its throat.

The Boston pair returned to nest on the McCormack Post Office and Court House Building after nesting on the Customs House tower last year. All four eggs hatched and three chicks fledged. However, one of the young falcons was killed two days after fledging when it struck the reflective all-glass Exchange Place Building (the site of a previous Peregrine Falcon mortality in 1986). This was the third year of successful nesting for this pair and the second year in which they succeeded without assistance. All five of this year's chicks were banded for future identification. An early spring survey of historic nesting cliffs failed to locate prospecting falcons. However, two falcons were seen on the University of Massachusetts campus in Amherst where five chicks were released through a "hacking" program in 1988.

Piping Plover: The total number of Piping Plovers in 1989 was at least 135 pairs, as compared to 134 pairs in 1988, 126 pairs in 1897, and a peak of 139 pairs in 1986. More than 50 cooperators helped gather data and protect these birds across the state. Plovers nested at 52 beach sites, compared to 55 in 1988. One encouraging observation was a dramatic improvement in nesting success; with about 1.5 plover chicks fledged per pair, up from 1.29 a year earlier. The use of predator exclosures was one factor apparently responsible for this improvement. Of 53 nests protected by predator exclosures, 45 successfully hatched young.

Terns: Results of the 1989 tern inventory were mixed, though generally there was no dramatic change in 1989 compared with the previous year's results. The biggest news for 1989 was the continuing improvement in Common Tern numbers. For the fifth consecutive year, Common Terns increased, breaking over the 10,000 pair mark and attaining their highest population level since comprehensive annual monitoring began in 1970. A final total of 10,199 pairs at 25 stations represented a 7% gain over the previous year's results of 9,533 pairs. Since 1985, improvement has averaged 8% annually. Eleven sites (10 in 1988) harbored 100 or more pairs. Many of the traditional large colonies seemed to be off slightly compared with previous year's estimates, but these declines were more than offset by increases at others. Unfortunately, estimated numbers of Roseate Tern slipped for a third consecutive year to 1,576 pairs (down 5%). It is still difficult to state whether this marks a significant trend, since current estimates fall within the range - albeit at the low end - calculated over the period 1970-88. It seems worrisome (and equally mysterious) that Roseate Terns do not seem to be mirroring the trend seen in the Common Tern population. Nesting Arctic Terns, slipping below the previous low of 16 pairs recorded in 1984-85, numbered only 15 pairs at three sites in 1989. Least Terns declined nearly 17% from the record 1988 levels, with an estimated 2,233 pairs at 43 stations. The final estimate included adjusted Nantucket figures to reflect particularly late nesting there. About 58% of the population was concentrated in six large colonies. The mean colony size for 1989 was 51.9 (51.6 in 1988). The median colony size was 22 (20 in 1988).

Common Loon: Nesting occurred at four reservoirs where eight of nine territorial pairs laid eggs. Five of these pairs succeeded in fledging eight of nine chicks that hatched. Heavy precipitation resulting in rising water levels during the nesting season caused the failure of two and possibly three nests and threatened a fourth. Even with these problems, the eight chicks fledged compared favorably with the nine fledged the previous year.

Osprey: Of the 179 occupied nests in 1989, 152 were active and 114 of these were successful; all represent increases over 1988 figures. The total number of young fledged, 231, was down by nine birds from the previous year.

Great Blue Heron: A complete survey of Great Blue Heron colonies is scheduled every second year. In June 1989, 38 colonies were visited and 22 were found to be active. The 16 inactive colony sites had been abandoned. Great Blue Heron colonies are dynamic and small colonies frequently relocate from one year to the next so these findings do not necessarily represent a decline in heron numbers. Five of the 22 active sites were new since the last survey in 1987. The total number of nesting pairs observed in 1989 was 266 which does represent a slight decline from 284 in 1987, and the peak of 308 in 1985. The mean colony size was 12.09 nests (range = 1 - 50). Estimated productivity declined from the record noted in 1987 (3.17 young/nest) to 2.71 young per nest. This figure is close to the seven year (1980 - 86) mean of 2.69 (range = 2.20 - 2.90). Five hundred eighty-nine young were counted at nests for which brood counts were available (217). Conservatively estimating 2.0 young per nest without brood counts yields an estimate of 683 young produced in 1989.

Reptiles & Amphibians

Plymouth Red-belly Turtle: Twenty six nests were discovered and caged to protect them from predation. Five additional nests were discovered after they had been subject to predation. From successful nests, 116 hatchlings were released immediately after emergence and 95 were transferred to cooperators for "headstarting" for a total of 211 hatchlings. These hatchlings will be kept over the winter and released in the spring of 1990. Approximately 130 hatchlings were retained in 1988 for headstarting by nine cooperating organizations. On May 30, 1989, these turtles were released into eight ponds in Plymouth and Carver.

Invertebrate Animals

The Program funded several invertebrate projects through the Small Research Contracts program including studies of the Puritan Tiger Beetle, the Decodon Stem Borer Moth, and rare dragonflies and damselflies. In addition, the Program had a contract with the National Park Service to conduct inventories for rare invertebrates within the Cape Cod National Seashore.

American Burying Beetle: The American Burying Beetle, a proposed candidate for federal listing, once occurred throughout most of the eastern United States but has disappeared from virtually all of its former range. This large, showy beetle is now known only from one New England island and from a small area of Oklahoma. Three trips were made to Penikese Island, one of the Division's Wildlife Sanctuaries, in an effort to rediscover this rare beetle in Massachusetts. The American Burying Beetle was previously recorded on Penikese Island in 1923 and 1947. Live traps were set for eight nights and 609 individuals of six species of burying beetles were captured but no American Burying Beetles were discovered.

Nongame Advisory Committee

The Nongame Advisory Committee continued to be very active, meeting monthly to advise the Division on: promotion of the Nongame Wildlife Fund, the Natural Heritage & Endangered Species Program's budget, small research contract priority topics and funding decisions, and changes to the official rare species list. Activities of particular note were: a resolution sent to the U.S. Fish & Wildlife Service urging it to form an Eskimo Curlew recovery team; a recommendation to prohibit the importation of raccoons into Massachusetts; review of proposed wildlife rehabilitation regulations and problem animal control regulations; and review of the proposed endangered species bill.

Nongame Wildlife Committee Members:

Dr. Gwilym Jones, *Chair*
Caren Caljouw, *Vice-Chair*
Marilyn Flor, *Secretary*
Kathleen Anderson
Dr. Barre Hellquist
Dr. Mark Pokras;
Dr. Fred Greeley, *Archivist*

Associate members: Doug Smith, Paul Kress(thru 11/88), Chris Leahy, Sharon Dean, Abigail Avery, Dr. Bill Patterson(3/89), Dr. Mike Ross(3/89), and Richard LeBlond(6/89).

Natural Heritage & Endangered Species Program Staff

Thomas French, *Assistant Director*
Henry Woolsey, Coordinator
Bradford Blodget, Ornithologist
Jay Copeland, Environmental Reviewer
Meg Goodwin, Data Manager
Steve Roble, Wetlands Wildlife Biologist
Bruce Sorrie, Botanist
Patricia Swain, Ecologist
Annie Woolsey, Protection Planner

INFORMATION & EDUCATION

Ellie Horwitz
Chief, Information & Education

The Information and Education Section serves the public through numerous forms of outreach. As part of this effort, all staff members respond to telephone and mail inquiries and provide presentations to a wide variety of organizations, including civic groups, school groups, youth groups, conservation organizations and sportsmen's clubs. Activities are limited by availability of staff and time. During this year certain activities were curtailed due to financial constraints. Other activities received a boost as a result of the addition to the staff of Dan McGuiness, who serves as hunting/fishing data specialist and coordinates the license and awards programs.

Media Outreach

The Section maintained a steady flow of information to members of the communications media. During 1989 (press reports are monitored on a calendar year basis) the Section issued 26 press packets containing 107 press releases, a significant decrease from 1988. This decrease was a deliberate effort to control the costs of the press program in a time of tight budgets. These releases generated 3,820 clippings, or an average of 318 articles per month (about 10 clippings/day). 455 of these were substantial, feature length pieces — either placed on a front page or taking up at least one half of an interior page.

In addition to press releases, the Section assisted members of the media by hosting three special press events:

- banding young eagles at Quabbin
- release of headstarted Plymouth red-belly turtles
- unveiling of the stream-liming operation at Whetstone Brook in Wendell.

Furthermore, Section staff provided current and background information to members of the media seeking information on wildlife and wildlife-related issues and updated mailing lists of writers and members of the electronic media.

An extensive survey was conducted during the year to determine how well the Division's press program is meeting the needs of news writers and members of the electronic media. Nearly 50% of the 300 media representatives responded on the first mailing. 96% of the respondents indicated that they found the releases good or excellent and 82% indicated that they used material directly from the releases. Some concern was expressed about delays in the delivery of releases. This will be the focus of some effort in the coming year.

Annual Materials

As required by law, the Section prepared and produced Abstracts of migratory bird hunting regulations for 1988 and Abstracts of fish and wildlife laws and regulations for 1989. During this year the design of the license — introduced in 1987 — was modified to place more information on the first panel. This provided convenience for the sportsmen by reducing the need for sportsmen to take their licenses out of holders. The Section also produced the annual waterfowl stamp; the archery/primitive firearms stamp and an attractive gift envelope to be used by those giving a license as a holiday gift.

Exhibits

This year, as in the past, the Division took part in a variety of shows and exhibits, providing live animal displays where possible. The Division was featured in the center of the Massachusetts Building at the Eastern States Exposition where the display focused on the restoration of Atlantic salmon in Massachusetts. The Division also had a large display for the Eastern Fishing and Outdoor exposition (Worcester), the Greenfield Fair and the Topsfield Fair. Photographic displays were designed for use at smaller fairs and one day events such as the New England Environmental Conference and the Annual Meeting of the Mass. Association of Conservation Commissions.

Photography

This year the Division's photography staff was reduced to one with the retirement of senior photographer Jack Swedberg. This left photographer Bill Byrne very busy providing photographs for Massachusetts Wildlife magazine, the first-ever Massachusetts Wildlife calendar, miscellaneous Division publications, and writers who were producing pieces about wildlife in Massachustts and needed illustrations.

Special photographic efforts were made to record:

- the first successful nesting of bald eagles in Massachusetts since 1905
- the installation of nesting poles for osprey
- the harvest of big deer in Massachusetts
- fishing for American shad and channel catfish on the Connecticut River

Publications

The Division's primary publication is ***Massachusetts Wildlife*** magazine, which, after 34 years as a free publication, became a paid subscription publication in the summer of 1986. Circulation stood at 21,000 at the beginning of this fiscal year and there were hopes that it would continue to rise as in the first two years. This did not happen due to changes at the Registry of Motor Vehicles, which had been the primary source of publicity for the magazine. As publicity channels had to be redirected and new materials developed since the Registry terminated its agreement with the magazine, the level of recruitment of new subscribers declined and the magazine finished the year with 17,500 subscribers.

Despite this setback, the outlook remains positive. New materials, including a direct mail package, have been developed for promotion. New channels (including mailings with deer permits) are beginning to bring subscriptions, and the system put in place to serve subscribers seems to be operating exceptionally well.

Editor Peter Mirick produced four 40 page issues covering a wide variety of outdoor subjects including pieces on management, habitat enhancement, rare and endangered species and "how-to" articles for the hunter, angler and nature watcher. One article, written by Mirick in the Winter 1988 issue, won first prize in the 1988 Outdoor Ethics Competition sponsored by the Izaak Walton League, the Fred Bear Sports Club and the Association for Conservation Information!

A limited number of other publications were produced and issued during this period:

- **Division of Fisheries and Wildlife: Mandate, Structure and Goals**
- **An Atlas of Massachusetts River Systems**, published by the Department of Fisheries, Wildlife and Environmental Law Enforcement and the University of Mass. Press, received substantial contribution from Section staff
- **A Homeowner's Guide to Bats**
- **Eagles in Massachusetts**
- **Shad in Massachusetts**

Publications previously produced were revised and reprinted as needed.

Education

The focus of educational activities expanded considerably during this period. In addition to working with the Massachusetts Junior Conservation Camp and Project WILD, the Section reached out to the public through Aquatic WILD, the Aquatic Resources Education Program (operated through the Fisheries Sec-

Editor Peter Mirick, winner of the 1988 Outdoor Ethics Competition.

tion) and the Envirothon. In addition to these programs, Section staff provided special classes and assembly programs to schools and scout groups as schedules allowed.

Conservation Camp:

As in the past, the Division handled pre-season publicity and registration for the Conservation Camp. During the camp season Section staff members, district staffers and hatchery personnel conducted sessions on pond and stream ecology, Wildlife Management, and Trout Culture. Section staff adminstered the final examination and participated in the camp's graduation.

Project WILD:

This program has continued to grow as facilitators continue to teach about wildlife through WILD activities and supplement their instruction through the use of Aquatic WILD materials. By the end of FY '89 a total of 1629 educators had completed Project WILD/Aquatic WILD workshops. Figuring that each educator reaches at east 30 students each year, this translates into contact with roughly 48,000 students per year.

Refresher courses were also held for facilitators. The WILD newsletter was issued three times and an appreciation lunch was held to thank facilitators and to honor those who had provided exceptional service.

The coordinators attended the national conference of WILD Coordinators, which provided an exceptional opportunity to exchange program ideas and to learn new techniques of WILD outreach. The coordinators also hosted a meeting of the national WILD Steering Committee in October and hosted the annual WILD Coordinators Conference in Craigville in June.

Aquatic Resources Education Program:

The Aquatic Resources Education Program continued to grow in its efforts to instill a stronger understanding and appreciation for aquatic resources throughout the Commonwealth. Program staff and volunteers participated in 13 exhibits, reaching approximately 3,500 individuals and helping interested individuals to get involved with the program. The Coordinator and volunteer instructors conducted 8 instructor training sessions bringing the statewide total of certified instructors to 156.

Stream ecology, Junior Conservation Camp.

The program's strongest educational tool is the special one-day festivals. Volunteers took part in 28 of these events reaching an estimated 3,800 students. For students who wanted additional depth of instruction, volunteers conducted 23 classes as part of a four-week basic freshwater fishing course. This course reached 384 new young anglers. **Short Casts**, the program's bi-monthly newsletter, continued, and a 2nd annual volunteer appreciation banquet was held in March.

Envirothon:

During this year, the Massachusetts Extension Service approached the Division with a request that we participate in a statewide Envirothon. This was to be a day-long festival at which students from area high schools could compete against each other in an environmental information olympiad. The first Massachusetts Envirothon, based on a model pioneered in Pennsylvania, was held in Spencer during the summer of 1988. Division staff participated by designing and implementing the presentation for the aquatics and the wildlife stations. The Chief of Information & Education serves on the Envirothon steering committee as a Divisional representative.

SAGEE:

During this year a group of environmental educators, including the Chief of

Information & Education, were called together to serve as an advisory group to the Secretary of Environmental Affairs. This group, known as the Secretary's Advisory Group on Environmental Education (SAGEE) has met, organized and plans to examine the status of environmental education in the coming year.

Special Programs and Events

Employees Conference: Section staff prepared a conference designed to enhance team building within the agency and to further familiarize Division staff with new programs in the Division and progress in existing programs.

National Conference, Project WILD Coordinators: The national conference of Project WILD coordinators was held in Craigville in June of 1989. Over 130 WILD Coordinators and invited participants attended the week-long meeting which focussed on Coordinators dealing with budget limitations and on sharing of activity extensions among states.

Fuertes Prints: By the end of the fiscal year the Division had completed the first half year of promotion of the sale of three prints by reknowned bird artist Louis Agassiz Fuertes (1874 - 1927). Three of Fuertes's paintings, prepared for **Birds of Massachusetts and Other New England States**, are now available for sale. They are the Sea ducks, Herons and Egrets, and Redpolls. Promotional materials — including a postcard and two print ads — were developed, and contact was made with art dealers throughout the nation. During calendar year 1989, 162 of these prints were sold raising $19,434.50. Half of the proceeds are applied to the Inland Fish and Game Fund, the other half goes to the Massachusetts Nongame Wildlife Fund.

Sportfishing Awards Program: This program entered a new phase of growth as regulations were tightened, check stations were required to show proof of recent certification of scales and additional check stations were added for the convenience of anglers. During calendar year 1988 the Division received 726 qualifying affidavits from 562 anglers. 1988 award winners were honored in February 1989 at a ceremony held in conjunction with the Eastern Fishing Exposition in Worcester.

Tags 'N' Trout: This program drew a record number of sponsors. Twenty six organizations provided prizes to cover 627 specially tagged fish, providing a donated value of up to $12,540 in prizes. These prizes were available to anglers in any part of the Commonwealth. Both the Division and local sponsors joined forces to advise anglers of the locations of the Tags'n'Trout programs.

Information & Education Staff

Ellie Horwitz, *Chief*
Bill Byrne
Priscilla MacAdams
Debbie McGrath
Dan McGuiness
Peter Mirick

REALTY

William J. Minior
Chief, Wildlife Lands

The Division, acting primarily through Chapter 723 bond funds, acquired 39 tracts of land in Fiscal '89. A gift of 5.74 acres in the Town of Eastham from Ducks Unlimited marked the first expenditure of funds under the MARSH (Matching Aid to Restore States Habitat) Program in the Commonwealth. Other acquisitions of interest in which Fisheries and Wildlife became involved were a public access on Lake Lorraine with Public Access Board (PAB) funding and a joint venture with the Department of Environmental Management of 360 acres along the Quashnet River in the Town of Falmouth. The Nature Conservancy, Connecticut River Watershed Association and Berkshire County Land Trust and Conservation Fund assisted individually on various transactions throughout the Commonwealth. A departmental acquisition and a taking completed Fisheries and Wildlife's land acquisition activity for 1989. In all, Fisheries and Wildlife acquired or assisted in 41 acquisitions for a total of 3,649.1 acres. Approximately 59,189 acres are now protected through Fisheries and Wildlife's acquisition efforts. These acquisitions are divided as follows:

WESTERN DISTRICT
Expended - $904,340.00
Acreage - 1170.45
Cost per Acre - $772.64

VALLEY DISTRICT
Expended - $767,172.00
Acreage - 753.68
Cost per Acre - $1,017.90

CENTRAL DISTRICT
Expended - $1,512,900.00
Acreage - 832
Cost per Acre - $1,818.39

NORTHEAST DISTRICT
Expended - $1,938,280.00*
Acreage - 302.91*
Cost per Acre - $6,398.86

SOUTHEAST DISTRICT
Expended - $3,518,590.06*
Acreage - 590.09*
Cost per Acre - $5,963.71

Total Expended - $8,641,282.06*
Total Acreage Acquired - 3649.13*
Average Cost per Acre - $2,368.04*
*Includes departmental acquisitions

Connecticut Valley District

Five of the Connecticut Valley's thirteen acquisitions were in the vast Satan's Kingdom area of Bernardston and Northfield. Public access needs were assisted through acquisitions on Lake Lorraine in Springfield (PAB) and of a parking facility on Little Alum Pond in Brimfield. Large amounts of stream frontage were also protected along the Millers River in Wendell and along Spaulding Brook in Montague. Additions were primarily to the Satan's Kingdom WMA, Millers River WMA and Poland Brook WMA, although a new area, the Warwick WMA, was acquired. The Connecticut River Watershed Association acted as the third party in the protection of some 250 acres along Spaulding Brook in the Town of Montague. The Valley District increased its land holdings by approximately 20% and now manages nearly 4500 acres.

Biologist James Cardoza scans turkey habitat in the Berkshires.

Central District

Nine acquisitions in the Central District have added over 830 acres of valuable habitat. Most tracts were water oriented with the most notable perhaps, being the approximately 170 acre tract from Cadillac Automobile Company of Boston located on Lake Quacumquasit and Quaboag Pond in Brookfield. This

Rowley Saltmarsh.

area has been designated the Quacumquasit WMA. It provides access to Lake Quacumquasit, Quabog Pond and it will also provide a boat access to South Pond (Quacumquasit). Large additions to the Phillipston and Millers River WMAs were also concluded. Acquisitions on Fish Brook in Royalston, the Ware River in Ware and Moose Brook in Barre are pilot areas with additional acquisitions anticipated. One acquisition from the MDC/F&W account placed 62 acres in the Stillwater River Corridor under public ownership. The Division of Fisheries and Wildlife presently owns approximately 17,270 acres in the Central Wildlife District.

Western District

Ten acquisitions totalling 1170.45 acres were added to district holdings in the scenic Berkshires. Additions were made to six existing WMA's and two new WMA's were initiated. The Hancock WMA consisting of approximately 200 acres and the Otis WMA, abutting Otis State Forest and containing 83 acres were established. River access additions along the Housatonic, Westfield and Green Rivers complemented previous holdings. The Berkshire County Land Trust and Conservation Fund assisted in the acquisition of valuable trout habitat on the Green River in Williamstown and a significant upland parcel abutting the Chalet WMA.

Northeast District

Acquisition of the 230 acre Three "H" Trust tract in the Town of Ashby created a new WMA in the heavily populated Northeast District. Additional acreage abutting this tract is currently under option. A 55.9 acre acquisition abutting the Boxford Wildlife Sanctuary insures access to this popular area. A departmental acquisition of 16.4 acres along the Weymouth Back River in Hingham added a valuable link to the existing greenway.

Southeast District

The Nature Conservancy acted as third party in three Southeast District acquisitions of Rare and Endangered properties. The Sly Pond tract added 192 acres to Myles Standish State Forest while protecting endangered habitat. Fisheries and Wildlife undertook a joint acquisition with DEM to protect Fisheries and Wildlife's existing corridor along the Quashnet River in the Town of Mashpee. This 360 acre addition will add substantial protection to the water quality of the Quashnet River and Waquoit Bay. Ducks Unlimited (D.U.) through its Marsh Program, acquired on behalf of Fisheries and Wildlife a 5.74 acre tract of waterfowl habitat abutting the National Seashore property in the Town of Eastham. A departmental taking of 18.35 acres in Edgartown added significantly to existing protected habitat.

Total Acreage by Area Type

	#	Acres
Wildlife Management Areas	55	52,290.2
Wildlife Sanctuaries	13	1,235.5
Fish Hatcheries	5	629.3
Game Farms	3	373.9
Streambank	22	2,815.8
Salt Marsh	2	378.05
Lake & Pond Access	10	81.3
Fisheries & Wildlife Areas	1	72.0
Nongame Areas	8	474.2
Other*	18	839.0
	Grand Total:	59,189.2

*Includes: Pond Systems, Military Lands, Forest Areas, Wildlife Districts, Islands, and Hatchery Land, MDC/F&W Area and Marsh Management Area.

DISTRICT REPORTS

Northeast District, Walter Hoyt, District Wildlife Manager

Southeast District, Louis Hambly, Jr., District Wildlife Manager

Central District, Chris Thurlow, District Wildlife Manager

Connecticut Valley, Herman Covey, District Wildlife Manager

Western District, Tom Keefe, District Wildlife Manager

The five wildlife districts form the field presence of the Division of Fisheries and Wildlife, administering wildlife lands, conducting on-site management, and dealing with wildlife issues pertinent to their respective regions.

Staff from the districts conduct fisheries and wildlife surveys and help to gather data for research programs. They conduct trout and pheasant release programs and release northern pike and tiger muskies where appropriate. They operate checking stations where sportsmen register deer, bear, turkeys and furbearers. They serve as liaison with conservation organizations, including sportsmen's clubs, within their district, conduct educational programs and respond to individual and media inquiries. Another key activity of District personnel is to provide advice and technical assistance to persons and/or other agencies dealing with wildlife problem situations. In this context, District staff deal with a large number of beaver complaints, deer damage complaints and other issues dealing with wildlife impacts on human habitations.

All district personnel distribute licenses, abstracts, stamps and other materials related to the sale of hunting/fishing/trapping licenses. They assist officers from the Division of Law Enforcement to assure public adherance to wildlife laws and regulations, and they assist the staff of the Division's Wildlife Lands Section in locating titles and landowners, and in making arrangements for the Division's aquisition of lands for wildlife.

During the past year District staff participated in a wide variety of research programs including the mid-winter eagle survey, waterfowl inventory and banding, census of mourning doves, woodcock and quail, and a survey of great blue heron rookeries. They also monitored water chemistries of lakes and streams prior to releasing fish into them. District staff reviewed the Environmental Monitor for development projects that would affect wetland areas and provided technical advice on the control of environmental problems — particularly in the handling of nuisance animal situations. District managers served as the Division's public relations/education outreach, spending many hours with civic and sportsmen's groups and responding to inquiries from interested citizens. Demand is heavy (e.g. the Northeast District manager spent 42 evenings representing the Division and its programs to sportsmen and environmental groups.)

All Districts offered programs which introduce visitors to the Division and its activities. All participated in the release of specially tagged fish through the Division's Tags'n'Trout program. All districts actively managed wildlife management areas in their region. This involved brushcutting, mowing, trimming trails, designing forest cutting operations, planting shrubs and maintaining roads and parking areas. Additional maintainance was needed on nesting boxes placed on wildlife management areas for wood ducks, bluebirds and purple martins. Maintainence was also needed on Division buildings and vehicles.

In addition to the activities that are common to all of the Districts, there were certain projects which required the participation of staff from only certain Districts.

Staff from the **Northeast District** assisted in the youth hunt for upland game species, a program in which young sportsmen and women have the opportunity to hunt alongside a master trainer and dog handler. District personnel participated in coastal waterfowl surveys, banded geese, and assisted in the building of 100 bluebird boxes. Through the efforts of the District Manager it was possible to forestall an effort to ban the discharge of firearms in the town of Westford.

The **Southeast District** also conducted all the basic Division projects. This was made difficult, however, by the retirement of Fisheries Manager John B.Dixon and the Division's inability to hire a replacement due to a statewide hiring freeze. Staff surveyed Hockomock Pond, Taunton, and Great Pond, Truro. A study of holdover brown trout is underway at Gull Pond, Wellfleet and a study of alewives is in process at Goose Pond, Chatham. The District worked with the towns of North Attleboro and Whitman on the dredging of Whitings and Hobarts Ponds and the subsequent restoration of the fisheries in those ponds. As a special project, Division personnel managed limited deer hunts during the archery, shotgun and primitive firearms seasons at Otis/Edwards Military Reservation adding 2798 man-days of recreational deer hunting. District staff also participated in the banding of geese and the selection of a release site for wild turkeys being moved to the District as part of the Division's wild turkey restoration project.

Central District staff participated in the ongoing management and research programs which involve all Districts and included a program of fish development of landlocked salmon and lake trout at Wachusett Reservoir. This District conducted a study of alewives at South Pond in Brookfield and a study of brown trout carryover and growth potential at Webster Lake, Comet Pond, South Pond, Big Alum Pond and Lake Quinsigamond. During this year District staff also began dismantling the "eagle hacking" tower which had served as a focal point for the Division's bald eagle restoration project for the past eight years. As this program has succeeded in bringing bald eagles to nest in the Commonwealth, the "hacking" tower used for rearing and release of young birds is no longer needed.

Connecticut Valley District staff also conducted the many activities required of each District. In addition to this they participated in the stocking of juvenile salmon into the Quabbin reservoir. They assisted in a limnological survey of the Deerfield River as part of the hydroelectric relicensing process, and they constructed floating platforms for use by nesting loons. They erected three sixteen-foot gates at access points to the Rainbow Beach WMA, they constructed duckblinds on the Ludlow WMA and they participated in teaching at the Massachusetts Junior Conservation Camp.

Western Wildlife District staff received the greatest number of complaints from landowners/homeowners who were intolerant of wildlife activities on their lands. Thus they provided advice on nuisance bears, beaver problems, deer damage and coyote depredations.

This district was heavily involved in live-trapping wild turkeys scheduled for re-location to eastern parts of the state which provide good turkey habitat but do not have a seed population. Later in the year the District staff participated in an experimental four-acre controlled burn as part of the long range plan for the Hy Fox WMA in Worthington. During the fall personnel from this District coordinated the special deer hunt hosted annually by local sportsmen and landowners for specially challenged sportsmen. This ever popular and highly successful program, which has been in operation since 1972 (and in the Western District since 1978), provides a unique opportunity for paraplegic sportsmen to be able to continue to participate in field sports without having to compete for space with large numbers of other hunters.

District Personnel

Northeast District:
Walter Hoyt, Manager
Tom Sheehan, Game Manager
Peter Jackson, Fisheries Manager
Dave Ford
Russell Garland
Lawrence Howie
Howard Kreiser
Frank O'Meara

Southeast District:
Louis S. Hambly, Jr. Manager
Richard Turner, Game Manager
Vacant, Fisheries Manager
Joseph Comick
Ed Kraus
James Polk
Richard Norton

Central District:
Chris Thurlow, Manager
Michael Ciborowski, Game Manager
Lee McLaughlin, Fisheries Manager
Dave Carlson, Birch Hill WMA Supervisor
Paul Le Boeuf
Arthur Myers
Paul Orrizzi
Al Ortiz

Connecticut Valley District:
Herman Covey, Manager
Peter Pekkala, Game Manager
Philip Brenner, Fisheries Manager
Daniel Bielecki
Michael Dumont
Andrew Foley Jr.
Gary Galas
John Nowakowski, Jr.
Martin Wrubel

Western District:
Tom Keefe, Manager
Anthony Gola, Game Manager
Leo Daly, Fisheries Manager
Dale Beals
Joseph Kirvin
David St. James
Jerry Shampang

MAINTENANCE AND DEVELOPMENT

Stephen Henry
Senior Planner

Game Farms and Hatcheries

The large brooder house roof at the Ayer Game Farm received extensive repairs and was re-shingled. The backup generator was moved from the Sandwich Game Farm to the Ayer Game Farm to provide standby power for the critical needs of the farm, i.e. the incubator house. This unit will be wired into the system during the next fiscal year. A windstorm blew a large pine tree onto the Ayer Game Farm residence, destroying the roof and most of the second floor living quarters. Contractors were brought in to perform emergency repairs before the weather could do additional damage. The Nashoba Valley Vocational Trade School spent some time priming and painting a few of the game farm's buildings.

As a result of last year's test wells yielding good water at the East Sandwich Fish Hatchery, a gravel-packed well was installed. This facility has had a history of poor water quality which has affected fish survival. This new well is expected to provide good water both in quantity and quality. One of the large storage buildings at the Bitzer State Fish Hatchery was re-shingled.

Districts

Remediation of the gas tank leak at the Southeast District headquarters continues. Additional groundwater testing has been conducted, indicating that groundwater does not appear to be contaminated. The 21-E Environmental studies will continue into the next fiscal year with additional studies evaluating soil and groundwater contamination. Studies of arsenic of lead contamination at the Peterson Farm in West Bridgewater were completed this year. The consultants concluded that no further action is necessary as a result of the low levels of contamination found. The final report was sent to D.E.P. for review and comment.

FEDERAL AID

R. Stewart McCaig
Coordinator

Federal excise taxes on fishing, boating and hunting equipment provided $1,000,010 to the Division for fisheries work (Dingell-Johnson funding) and $1,110,000 for wildlife work(Pittman-Robertson funding) during the federal fiscal year that ended in September 1989. The Dingell-Johnson (D-J) apportionment included approximately $795,000 for assistance to the Massachusetts Division of Marine Fisheries in saltwater projects. Of the Pittman-Robertson (P-R) apportionment, approximately 55% was designated as an allowable expenditure for Hunter Education training by officers of the Massachusetts Division of Environmental Law Enforcement and their cadre of volunteer instructors.

The endangered species program received a federal allocation of $21,000 to be used by the Division's Natural Heritage and Endangered Species Program in restoring the Plymouth redbelly turtle, piping plover, roseate tern, and sandplain Gerardia. A report of federal funds encumbered showed, as of July 1, 1988, $1,291,875 in active P-R projects, $1,624,125 in D-J projects (including both freshwater and marine), and $20,400 in projects to restore endangered species, for a total of almost $3,000,000 of federal involvement in the restoration of sport fisheries, wildlife, and endangered species.

In June, the Division filed a report to the Regional Federal Office showing receipts from sale of 125,703 paid hunting licenses and 266,400 paid fishing licenses for the preceding state fiscal year, ending on 30 June 1988.

Much of the Federal Aid Coordinator's time was expended in pursuance of federal compliance issues under Title VI of the Civil Rights Act of 1964, that legislates to prevent unlawful discrimination as a result of bias against race, color, national origin, age, or handicap toward individuals who might wish to participate in program benefits; and under Section 504 of the Rehabilitation Act of 1973 that mandates accessibility of these benefits for all individuals regardless of physical impairment or handicap. In accord with these requirements, the Coordinator prepared an evaluation of Division facilities and programs which included recommendations for compliance with both laws. Findings and recommendations were based on communications as well as several tours of inspection by federal and state program representatives. Other subjects considered were: Certification of a Drug-Free Workplace, assurances that interest on license fees were credited to the Inland Fish and Game Fund, assurance that the Division does not discriminate against persons due to age, and assurance that Division administrators are willing to observe debarment and suspension lists produced by federal departments and agencies.

LEGISLATIVE REPORT

Fiscal Year 1989

Chapter 294. November 25, 1988, An Act Establishing a Procedure for the Disposal of Certain Killed Deer.

Summary

Gave the Director, with the approval of the Fisheries & Wildlife Board, the authority to establish a procedure for the disposal of road killed deer, and to specify by regulation the manner in which a tagged deer is to be displayed.

Chapter 193. July 26, 1988, An Act Further Regulating Permitted Shotgun Shell Size.

Summary

Gave the Director, with the approval of the Fisheries & Wildlife Board, the authority to promulgate rules and regulations prescribing the type and size of BB shot.

PERSONNEL REPORTS

NEW HIRES

James Polk	7/10/88	Laborer I
Wayne Corey	8/14/88	Laborer I
William Skutnik	8/14/88	Laborer I
John Moriarty, Jr.	8/14/88	Laborer I
Thomas Decker	10/16/88	Game Biologist II
James Guthrie	4/18/88	Laborer I (Seasonal)
Mark Kucenski	4/18/89	Laborer I (Seasonal)
John Irminger	4/20/89	Laborer I (Seasonal)
Paul Grimley	5/ 9/89	Laborer I (Seasonal)
James Lear	5/ 9/89	Laborer I (Seasonal)
Matthew Gonet	5/ 9/89	Laborer I (Seasonal)
Robert Bruce	5/ 9/89	Laborer I (Seasonal)
Steven Oatis	5/21/89	Laborer I (Seasonal)
Stephen Johnson	5/30/89	Laborer I (Seasonal)
Matthew Trainor	6/ 5/89	Laborer I (Seasonal)

PROMOTIONS

Joseph Ervin	7/24/88	Wildlife Tech. II
Paul Orrizzi	7/24/88	Wildlife Tech. II
Edward Kraus	7/24/88	Wildlife Tech. II
David Ford	7/24/88	Wildlife Tech. II
Gary Galas	7/24/88	Wildlife Tech. II
Susan Townsend	8/ 8/88	Wildlife Tech. II
Philip Brenner	9/25/88	Right of Way Agent II
Juliette Santos	10/23/88	Confidential Secretary
Wayne MacCallum	4/ 9/89	Director
James Guthrie	5/28/89	Laborer II (Seasonal)
Steven Williams	6/25/89	Program Manager

LEAVE OF ABSENCE

Nancy Limosani	11/20/88
James Polk	10/ 9/88

MISCELLANEOUS TRANSACTIONS

Susan Townsend	7/17/88	Laborer I
Wayne MacCallum	7/24/88	Program Manager
Anita Masterson	8/ 4/88	Bookkeeper II
Anita Masterson	10/22/88	Return - Bookkeeper II
Nancy Limosani	1/29/89	Part-time - Clerk V

TERMINATIONS

Paul Geyster	7/ 2/88	Laborer I (Seasonal)
Robert Newhall	7/ 2/88	Laborer I (Seasonal)
Steven Tanguay	7/ 2/88	Laborer I (Seasonal)
Alfred Glockner, III	7/ 2/88	Laborer I (Seasonal)
Peter Nelson	7/ 9/88	Laborer I
Andrew Foley, Jr.	7/30/88	Laborer I
Robert Lucas	7/30/88	Laborer I
Michael Dumont	7/30/88	Laborer I
Ann Lee	8/27/88	Confidential Secretary
Arthur Leonard	9/ 3/88	Laborer I
Scott Melvin	10/22/88	Game Biologist II

TERMINATIONS, continued

Matthew Pride	10/29/88	Laborer II (Seasonal)
James Guthrie	12/ 3/88	Laborer I (Seasonal)
Craig Lodowsky	12/ 3/88	Laborer I (Seasonal)
Henry Wadach	1/26/89	Laborer I (Seasonal)
Antone Fernandes, Jr.	2/8/89	Laborer I
Roscoe Perham, II	3/31/89 Fish	Culturist Asst.
Matthew Gonet	6/25/89	Laborer I (Seasonal)
Paul Grimley	7/ 1/89	Laborer I (Seasonal)
John Irminger	7/ 1/89	Laborer I (Seasonal)
Mark Kucenski	7/ 1/89	Laborer I (Seasonal)

RETIRED

John Dixon	7/29/88	Fisheries Spvr.	34 yrs.
John Boudreau	8/13/88	Game Cult. II	27 yrs.
Russell Garland	10/15/88	Laborer II	34 yrs.
John McGurn	4/17/89	Laborer I	11 yrs.
John Gromaski	7/ 7/89	Laborer II	35 yrs.

DECEASED

Richard Cronin	7/24/88	Director	37 yrs.

HOW THE SPORTSMEN'S DOLLAR WAS SPENT

Category	**Account #**	**Expenditure**	**Percentage**
Administration	2310-0200	615,348.00	
Information & Education	2310-0200	311,208.00	
	Subtotal	**926,556.00**	**13.11**
Fishkill Invest.	**2310-0250**	**6,662.00**	**.01**
Wildlife Programs			
Game Farm	2310-0400	253,189.00	
Wildlife Mgt.	2310-0400	817,590.00	
Wild. Coop.Unit	2310-0400	90,000.00	
	Subtotal	**1,160,779.00**	**16.32**
Fisheries Programs			
Hatcheries	2310-0400	1,028,034.00	
Fisheries Mgt.	2310-0400	1,145,420.00	
Fish. Coop.Unit	2310-0400	72,000.00	
	Subtotal	**2,245,454.00**	**32.00**
Construction Facilities	2310-0300	15,205.00	.02
Land Acquisition	2310-0310	193,793.00	3.00
Equipment	2310-0315	137,560.00	2.00
Magazine	2310-0312	70,529.00	.10
Hunter Safety	2350-0101	181,406.00	3.00
Shellfish	2330-0100	30,157.00	.04
	Subtotal	**628,650.00**	
Split Fund Account			
Nat. Heritage	2310-0500	85,687.00	
Law Enforcement	2350-0100	704,073.00	
	Subtotal	**789,760.00**	**11.18**
OTHER ASSESSMENTS			
Retirement (.2%)	0612-1000	614,000.00	**9.00**
TRANSFERS FROM FUND			
Group Ins.	1590-1007	314,000.00	
Debt. Service		50,000.00	
Interest		7,000.00	
Ret. Adjust.		23,000.00	
	Subtotal	**394,000.00**	**6.00**
Encumbrance Reserve		298,129.00	4.22
	TOTAL EXPENDITURES	**7,063,990.00**	**100**

APPROPRIATION AND EXPENDITURES

INLAND FISH AND GAME FUND

July 1, 1987 to June 30, 1988

APPROPRIATIONS:

Account #	**Approp.**	**Encum.**	**Expended**	**Reversions**
Administration 2310-0200	945,720	6,897	926,556	12,267
Fish Kill Invest. 2310-0250	47,718	5,239	6,662	35,817
Development 2310-0300	99,438	57,803	15,205	26,430
Land Acq. 2310-0310	200,000	0	193,793	6,207
Equipment 2310-0315	200,000	48,428	137,560	14,012
Operations 2310-0400	3,636,424	120,355	3,406,233	109,836
Subtotal	**5,129,300**	**238,722**	**4,686,009**	**204,569**

RETAINED REVENUE:

Account #	**Approp.**	**Encum.**	**Expended**	**Balance For.**
Magazine 2310-0312	154,341	21,520	70,529	62,292

FUND SPLIT:

Account #	**Approp.**	**Encum.**	**Expended**	**Reversions**
Nat. Her. Program 2310-0500*	98,889	1,806	85,687	11,396

GENERAL FUND:

Account #	**Approp.**	**Encum.**	**Expended**	**Reversions**
Acid Rain Program 2310-0550	255,920	30,257	225,663	0

CAPITAL OUTLAY:

Account #	**Activity**	**Appro.**	**Expended**	**Balance For.**
1102-7804	Build. Demolition	15,000	0	15,000
2310-7880	Hatchery Recon.	383,693	0	383,693
2310-7881	Fuel Tank Remov.	79,000	0	79,000
2310-7890	Well Repair	30,000	0	1,426
2310-7891	Repair Sandwich	500,000	0	500,000
2310-8840	Land Acquisition	2,133,952	702,949	1,430,003
2310-8841	Assoc. Cost (8840)	185,000	027,597	151,091
2310-8842	Land Acquisition	4,148,657	1,865,620	2,279,732
2310-8843	Assoc. Cost (8842)	527,379	122,284	346,177
2310-9845	Fuel Tank Remov.	140,833	7,986	132,847
2310-9848	Toxic Sub. Remov.	20,480	19,165	1,315
Total		**8,163,994**	**2,745,601**	**5,320,284**

FEDERAL GRANTS:

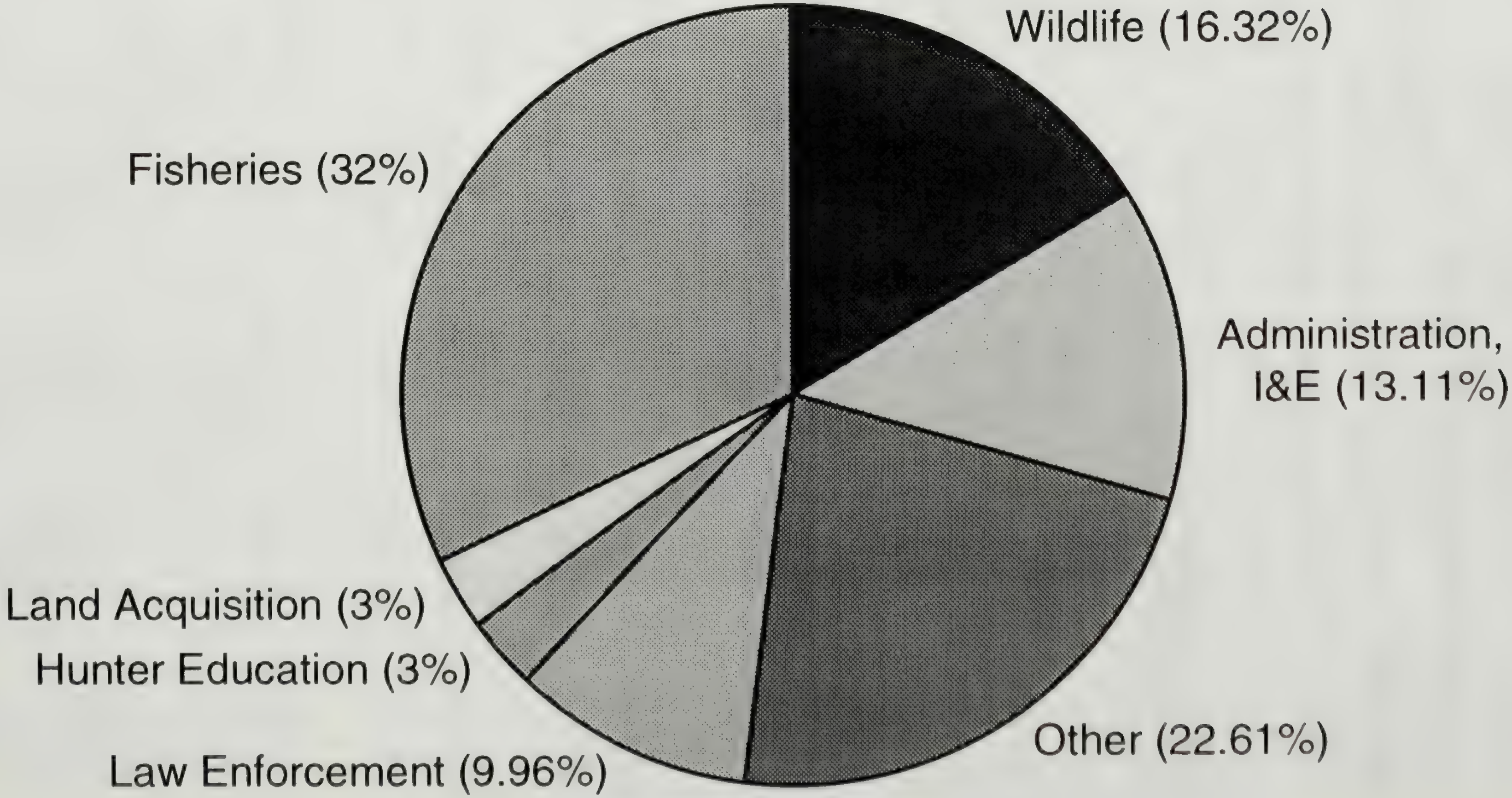
Account #	Approp.	Encum.	Expended	Balance For.
Whetstone Brk. 2310-9701	154,458	33,070	121,388	0

NONGAME WILDLIFE FUND ACCOUNTS:

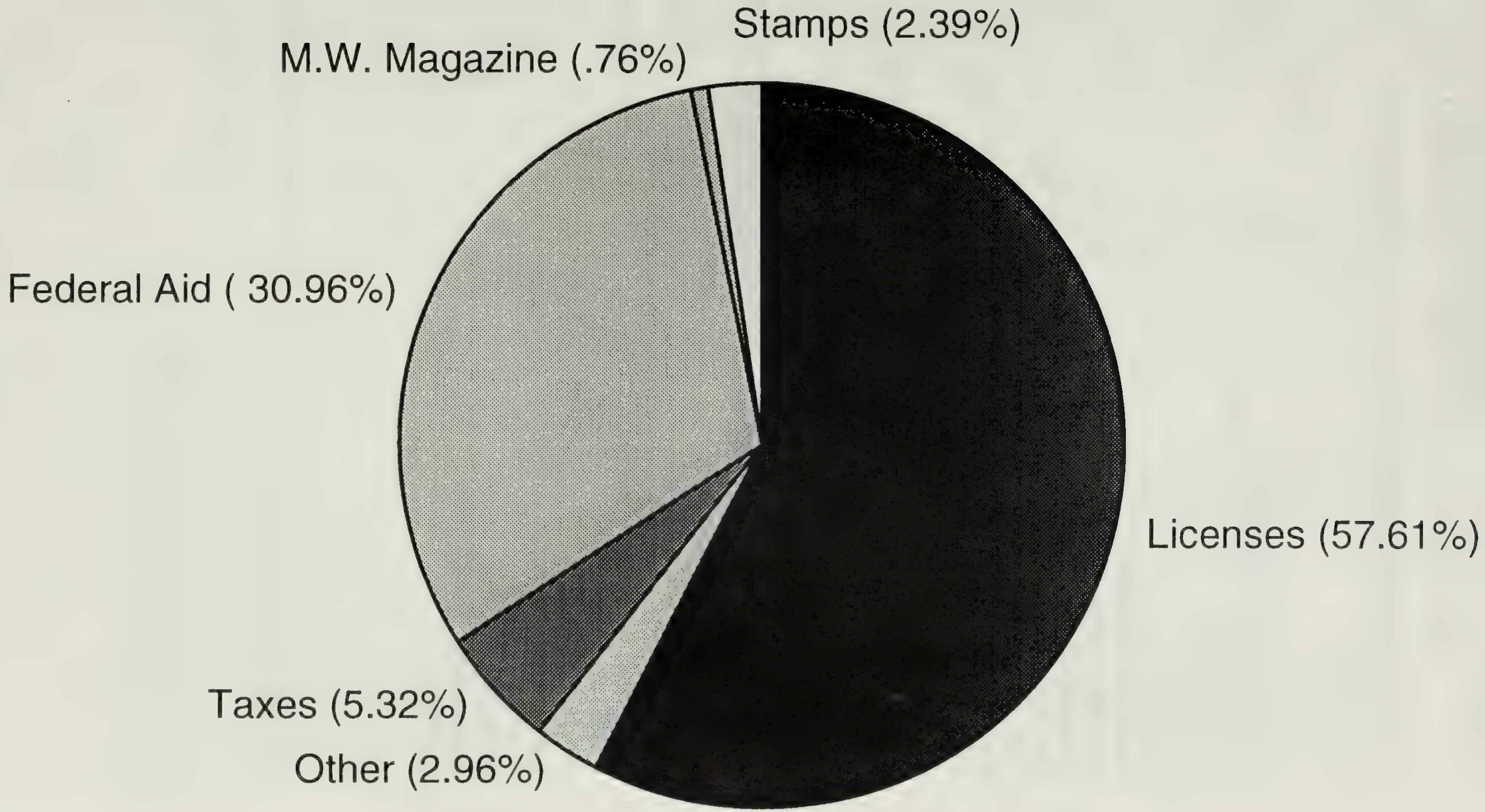
Account#	Approp.	Encum.	Expended	Reversions
Administration 2315-0100	303,042	34,324	249,369	19,349
Nat. Her. Prog. 2310-0500*	98,889	1,806	85,687	11,396

* 50% Inland Fish and Game Fund
50% Nongame Wildlife Fund

Expenditures



Income


Stamps (2.39%)
M.W. Magazine (.76%)
Federal Aid (30.96%)
Licenses (57.61%)
Taxes (5.32%)
Other (2.96%)

SUMMARY

REVENUE, OTHER FINANCING SOURCES, REVERSIONS

INLAND FISH AND GAME FUND

July 1, 1988 to June 30, 1989

COLLECTED BY AGENCY	**Amount**
Fishing, Hunting & Trapping Licenses	4,318,568.10
Archery Stamps	147,498.60
Trap Reg.	1,116.00
Waterfowl Stamps	10,119.10
Waterfowl Stamps/DU	27,769.20
Special Licenses, Tags & Posters	15,611.00
Antlerless Deer Permits	52,700.50
Bear Permits	7,325.00
Turkey Permits	60,850.00
Rents	35,865.90
Sales, Other	2,538.40
Refunds Prior Year	5,714.84
Misc. Income	3,592.00
Magazine Subscriptions	58,660.10
Shellfish Purification*	76,134.89
Fuertes Prints	875.00
Subtotal	**4,824,938.63**
COLLECTED BY STATE TREASURER	
Fines and Penalties	42,901.00
Interest	790.00
Subtotal	**43,691.00**
FEDERAL AID	
Pittman-Robertson	747,689.76
Dingell-Johnson	1,126,073.90
Anadromous Fish	0
Endangered Species	17,922.71
Indirect Cost Reimbursement	504,441.71
Subtotal	**2,396,128.08**
TAXES	
Gasoline Tax	412,000.00
TOTAL REVENUE:	7,676,757.71
Transfers from General Fund	
Reimbursement/Half Price Licenses	61,000.00
TOTAL OTHER FINANCIAL SOURCES	61,000.00
TOTAL REVENUE AND OTHER SOURCES	**7,737,757.71**
FUND EQUITY AS OF JUNE 30,1988	3,312,000.00

SUMMARY OF LICENSE SALES
FY 1989

Type of License	Unit Price	Quantity	Amount
Res.Cit. Fishing	$ 12.50	165,287	2,066,087.50
Res.Cit. Minor Fishing	$ 6.50	7,156	46,514.00
Res.Cit. Fishing (65-69)	$ 6.25	6,328	39,550.00
Res.Cit. Fish.(Blind-Para-M.Ret.)	FREE	3,981	0.00
Res.Alien Fishing	$ 14.50	2,424	35,148.00
Non-Res Alien Fish Cit.	$ 17.50	9,866	172,655.00
Non-Res Alien Fish(7 day)	$ 11.50	2,945	33,867.50
Res.Cit. Trapping	$ 20.50	614	12,587.00
Res.Cit. Trapping Minor	$ 8.50	61	518.50
Res.Cit. Trapping (65-69)	$ 10.25	38	389.50
Non-Res Trapping	$300.00	2	600.00
Duplicate Fishing	$ 2.00	1,365	2,730.00
Duplicate Trapping	$ 2.00	20	40.00
Res.Cit.Hunting	$ 12.50	40,982	512,275.00
Res.Cit. Hunting (65-69)	$ 6.25	610	3,812.50
Res.Cit. Hunting (Para)	FREE	189	0.00
Res. Alien Hunting	$ 19.50	1,037	20,221.50
Non-Res.Cit./Alien Big Game	$ 48.50	1,654	80,219.00
Non-Res.Cit./Alien Sm. Game	$ 23.50	1,345	31,607.50
Non-Res.Cit./Alien Comm.Shooting Pres.(3 day)	$ 19.50	333	6,493.50
Res.Cit. Sporting	$ 19.50	67,270	1,311,765.00
Res.Cit. Sporting (65-69)	$ 9.75	3,069	29,922.75
Res.Cit. Sporting (Over 70)	FREE	19,956	0.00
Duplicate Hunting	$ 2.00	518	1,036.00
Duplicate Sporting	$ 2.00	1,999	3,998.00
TOTAL LICENSE SALES		**339,049**	**4,412,037.75**
Archery/Primitive Firearms Stamps	$ 5.10	29,217	149,006.70
Sales to Collectors			191.90
Collection of Bad Debt			24,079.00
Fees Retained by Clerks			(119,259.85)
Trap Registrations*			1,116.00
Waterfowl Stamps	$ 1.25	21,644	27,055.00
Fees Retained by Clerks			(4,309.50)
Sales to Collectors			22,254.00
Refunds to Collectors			(7,100.00)
Total Net License & Stamp Sales		**389,910**	**4,505,071.00**

* Initials:	78@ 4.00	312.00
Renewals:	268@ 3.00	804.00

SPECIAL LICENSES, TAGS AND POSTERS

July 1, 1988 to June 30, 1989

Type of License	Quantity	Unit Price	Amount
FUR BUYERS			
Resident	16	25.00	400.00
Non-Resident	6	75.00	450.00
TAXIDERMIST	4	20.00	2,080.00
PROPAGATORS			
Special	63	1.00	63.00
Class 1			
Initial	2	15.00	30.00
Renewal	111	10.00	1,110.00
Class 3			
Initial	11	15.00	165.00
Renewal	85	10.00	850.00
Class 4			
Initial	36	15.00	540.00
Renewal	350	10.00	3,500.00
Class 6			
Initial	1	15.00	15.00
Renewal	29	10.00	290.00
Add. Stores	182	5.00	910.00
Class 7			
Initial	1	5.00	5.00
Renewal	9	2.00	18.00
Importation Permits			
Fish	7	7.50	52.50
Birds	112	7.50	840.00
Class 9			
Masters	7	25.00	175.00
Apprentices	11	25.00	275.00
General	14	25.00	350.00
Class 10			
Raptor Breeding	7	10.00	70.00
Class 11			
Raptor Salvage	24	1.00	24.00
Shiners	80	10.00	800.00
Field Trial	30	15.00	450.00
Eels	2	25.00	50.00
Quail for Dog Training			
Initial	2	7.50	15.00
Renewal	19	5.00	95.00
Shooting Preserve	9	50.00	450.00
Mounting Permit	6	2.00	12.00
Special Field Trial Permit	7	15.00	105.00
Tags & Posters			
Game Tags	7,995	.10	799.50
Fish Tags	12,437	.05	621.85
			15,610.85

Financial Staff

Nancy Melito
Assistant Director, Financial Affairs

Mary Cavalieri
Lillian Hew
Yunus Khalifa
Nancy Limosani
Carl Lui
Mary Lou Raples
Elizabeth Sienczyk
Ruthann Surrette

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**Division of
Fisheries & Wildlife**

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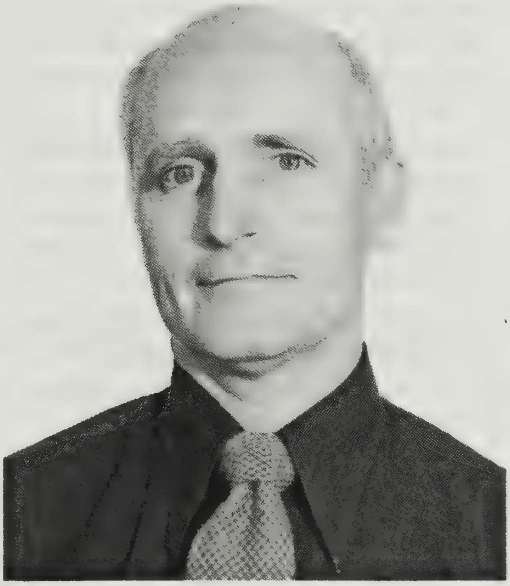
The Board Reports

George Darey
Chairman

The Massachusetts Fisheries and Wildlife Board is a group of seven persons, each selected for a demonstrated interest in wildlife. By law, the persons appointed to the Board are volunteers, receiving no remuneration or expenses for their service to the Commonwealth. Five of the seven are selected on a regional basis, with one member, by statute, representing agricultural interests. The two remaining seats are held by a professional wildlife biologist or manager, and a representative with a specific interest in the management and restoration of wildlife populations not classified as "game species." Each member is appointed by the Governor to a five year term. The Board oversees operations of the Division of Fisheries and Wildlife, reviews programs and sets policy and regulations pertinent to wildlife in the Commonwealth.

During this fiscal year the Board continued to hold monthly meetings at locations around the state, hold public hearings on proposed regulatory changes and address issues of specific concern. The budget and the need to hire personnel to bring the Division up to its full operational staff level were issues of particular concern to the Board. We are very pleased to report that the agency's budget experienced minimal cuts in this difficult fiscal year, and express our thanks to Deputy Director Jack Buckley, agency staff and the sportsmen throughout the Commonwealth whose cooperative efforts were responsible for this positive outcome. While some job vacancies yet remain within the agency, we are are also pleased to report that District Offices are now at full staffing for the first time in eight years, and we commend the Division's employees for their work and dedication in keeping all agency programs up and running during the long and trying period of staff shortages just past. They have again proven themselves to be exemplary state employees, and the citizens of the Commonwealth can take pride in their performance.



The fatal shooting of Peter Oatis, Assistant Director of Fisheries, at the Richard Cronin Field Headquarters Building in February, cast a tragic shroud over a year which could otherwise have been described as very successful. The loss of Mr. Oatis — good friend and professional, well-respected member of the staff who had successfully guided the management of the Commonwealth's freshwater fisheries for many years — was a terrible blow to the Division. We continue to mourn the loss of Mr. Oatis, finding solace only in our confidence that his replacement, Dr. Mark Tisa — promoted from within the Division's Fisheries Section — has the qualifications and experience to serve the agency with similar dedication and distinction.

While many different matters and issues were brought before the Board this year, most of its time was spent in scrutiny and review of Division programs and proposals for regulatory changes. Among the items examined were:

Trapping Regulations: The Board reviewed the existing trapping regulations and seasons and, following a public hearing last year and a lengthy period to address public comment, held an extra meeting in July to consider and vote on certain proposals which had been submitted to them including:

- restrict the size and use of padded traps on land and prohibit their use on pole sets or in trees (accepted)
- require the successful completion of a mandatory trapper education course for any first time trappers and any individuals wanting to use "soft-catch traps" on land (accepted)
- adjust trapping season lengths (and in some cases acceptable trap size and type) for fisher, fox, skunk, weasel, opossum, bobcat, mink, otter, raccoon, muskrat and beaver (accepted)
- establish a trapping season for coyote, discontinue mandatory carcass turn in of coyote and require only heads of coyote to be turned in (accepted)
- require mandatory pelt tagging of fox (accepted)
- require bobcat be tagged within four working days of harvest regardless of method of take (accepted)
- require that all pelts that are required to be tagged (except bobcat) shall be tagged within four working days of the close of that season (accepted)
- require the sealing of fox pelts if they are offered for sale (accepted)
- if a trap is stolen and is used illegally the owner is responsible unless the owner has reported it stolen by mail to the Division of Environmental Law Enforcement within 48 hours (accepted)

The Board voted to put the regulations into effect for this '89-'90 season, and also voted to review all trapping regulations again next year. On the eve of the trapping season a temporary injunction was placed on the regulations, and the matter has yet to be settled.

Deer Management: The Board considered and approved the number of antlerless deer permits to be issued for the 1990 hunting season.

Domestic Animal List: Following much discussion, a Public Hearing and further consideration, the Board voted to accept a Domestic Animal List. While many animals are obviously domestic and therefore do not come under the Division's jurisdiction, the increasing interest in importing and breeding exotic species for domestic purposes (e.g. llama, camel, ostrich, etc.) prompted the need for this list.

Waterfowl Management: The Board set waterfowl seasons and bag limits within the federal framework during a public waterfowl hearing. The Board also considered various options to increase the price of the state waterfowl stamp, and following review of public comment and a hearing, voted to increase the price of the stamp to $5.00. The increased revenues will be applied to protection and improvement of waterfowl habitat in eastern Canada, and indirectly, through Ducks Unlimited's M.A.R.S.H. program, to waterfowl habitat protection and improvement in Massachusetts.

Personnel Actions: As overseer of the operations of the Division of Fisheries and Wildlife, the Board votes confirmation of hirings, promotions, retirements and other personnel actions within the Division. During the year they presided over 18 new hires, three promotions, one retirement and one transfer. Noteworthy during this fiscal year (besides the promotion of Dr. Mark Tisa to Assistant Director of Fisheries) was the promotion of Ralph Taylor, Culturist at the Bitzer Hatchery in Montague, to the position of District Fish and Game Supervisor at the Connecticut Valley Wildlife District in Belchertown. He replaces the late Herman Covey, a competent, life-long Division employee who was an admirable Supervisor of the Connecticut Valley District for many years.

Other Activities: In the course of reviewing Division projects and programs the Board addressed numerous other issues and regulatory changes including Division response to fish kills, Division Land Use Policy, lake drawdowns and the Wildlands stamp. The Board also voted to authorize the Middlesex County League of Sportsmen to dedicate a monument to former Director Richard Cronin at the Squannacook Wildlife Management Area, and scheduled a public hearing to discuss and review a proposal to designate a Catch & Release Area on the Millers River.

Colton Bridges, good friend, colleague, and former Director, passed away this year. His knowledge, dedication and perseverance will be sorely missed. No replacement has yet been appointed.

Ray Whitaker left the Board this year when his term expired. We wish him well and thank him for his long and tireless efforts on behalf of the Board and the Commonwealth's natural resources. His former position was filled by Ernest Foster of Worcester.

Massachusetts Fisheries and Wildlife Board

George L. Darey, Lenox, *Chairman*
Nancy Begin, Topsfield, *Vice Chairman*
John F. Creedon, Brockton, *Secretary*
Colton F. Bridges, Grafton
Dr. Gwilym S. Jones, Framingham
Michael P. Roche, Orange
Ernest Foster, Worcester

Adiminstration

Wayne F. MacCallum
Director

John Buckley
Deputy Director
Administration

Carl. S. Prescott
Deputy Director
Field Operations

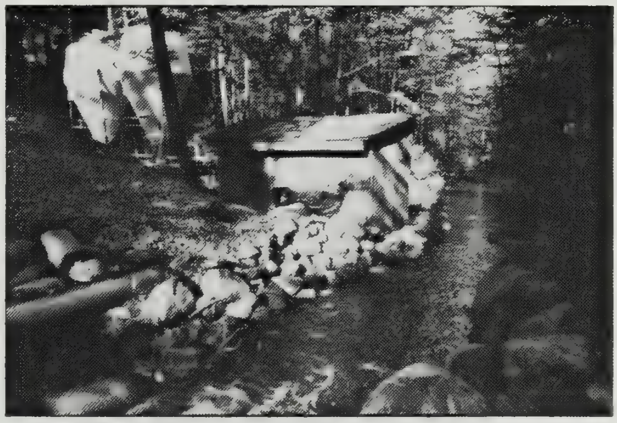
FISHERIES

Peter H. Oatis
Assistant Director

Fishing, hunting and wildlife related recreation are important recreational activities for residents and non-residents of Massachusetts. According to figures reported in the 1985 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, there are 689,300 resident Massachusetts fishermen aged 16 and older. This is 14% of the population. Additionally, more than 200,000 non-residents fished in Massachusetts. Each fishermen spent an average of 17.8 days fishing. Fishing pressure in Massachusetts is estimated at 40 trips/acre as contrasted to the national average of 27 trips/acre. In 1985, the Sport Fishing Institute estimated recreational fishing in Massachusetts generated 20.2 million dollars in sales tax revenue and created some 15,000 jobs (Oatis, unpublished manuscript).

The Commonwealth's aquatic resource inventory includes a variety of fisheries habitat ranging from coldwater streams and lakes supporting wild trout fisheries to warmwater rivers and ponds supporting panfish . There are approximately 2,675 lakes and ponds, totaling about 142,681 surface acres. Ponded waters are mostly less than 500 acres in size. The two largest bodies of water, both man-made to enhance drinking water supplies, are the Quabbin (25,000 acres) and Wachusett (5,000 acres) Reservoirs. Angler access is partially restricted on both reservoirs. The largest river in Massachusetts is the Connecticut River with 72 miles (7,284 acres) transecting the Commonwealth. The 2,027 named streams flow about 10,704 miles and comprise approximately 14,900 acres. The protection, management and enhancement of these inland fisheries resources and their associated habitats involves several ongoing fisheries projects.

This year was marked with great sadness by the tragic and untimely death of Peter Oatis, Assistant Director of Fisheries for over 20 years. Professionals and sportsmen alike mourned Oatis, who was killed in a incident at the DFW Headquarters, as a good friend and a highly respected colleague. Despite this loss, members of the Fisheries Section continued in their projected activities.



The Whetstone Brook Project has been underway since 1985. It is a joint federal and state project funded through the National Acid Precipitation Assessment Program's Acid Precipitation Mitigation Project (APMP), which is administered by the U.S. Fish and Wildlife Service. Whetstone Brook was chosen as the study stream in Massachusetts because fisheries and water chemistry data showed that it was impacted by acid precipitation. Whetstone Brook was once considered a prime wild trout stream, but starting in the late 1970's the natural fish populations declined and trout stocking had to be delayed until after the spring highwater period.

The purpose of the project is to determine the impact of adding calcium carbonate to neutralize waters impacted by acid precipitation. A water-powered device designed to automatically dispense limestone into Whetstone Brook was installed in April 1989. This device, which was specifically designed for use on Whetstone Brook, has functioned almost perfectly since going on-line and the liming goals of the project have now been met. The extensive data collected to date show that the stream pH has returned to safe levels and toxic aluminum concentrations have been reduced. Studies with caged rainbow and brown trout showed that the limestone-treated water was safe for fish survival, which is in contrast to the toxic conditions prior to treatment. Detailed monitoring of fish, invertebrates and stream chemistry will continue through 1991. The project has generated world-wide media interest and became the focus of feature news articles in Mexico City and a program on Australian television.

Anadromous Fish Investigations

Connecticut River

A total of 187 Atlantic salmon were counted at the Holyoke Dam Fishlift in 1990. Eighteen of these fish were released for upriver passage the remaining 169 were trapped and transported to the U.S. Fish and Wildlife Service's Richard Cronin National Atlantic Salmon Station in Sunderland for brood stock purposes. Sixteen of the eighteen salmon released at Holyoke were seen passing through the Turners Falls fishways. This was the largest number of salmon to use these facilities since they were opened in 1980.

Nearly equal numbers of American shad and blueback herring were counted as they passed the through the Holyoke Dam Fishlift, 363,725 and 392,157 respectively. The 27,908 shad seen using the Gatehouse Fishway was the second highest number to pass upriver of Turner Falls since the facilities were opened in 1980. Still, this represents only 7.7% of the shad passed at the Holyoke facility and is well below the restoration goal of 50% passage.

Other anadromous fish seen using the Holyoke and Turner Falls facilities included sea lamprey, striped bass and gizzard shad.

The estimated sport harvest of American shad in the area downstream from the Holyoke Dam was estimated by conducting a creel survey of shore and boat anglers in the area. Shore anglers outnumbered boat anglers nearly two to one. However, boat angler trips were about twice as long as shore angler trips, making the total expanded effort of both groups almost equal. Total number of shad caught was estimated to be 28,144, with 3,527 kept and the remaining 24,617 released. For the first time a creel survey was conducted in the Westfield River. This survey confirmed that a significant recreational shad fishery already exists in the Westfield River. The effort expended in this portion of the total creel survey will be expanded in future years.

Fry stocking of Atlantic salmon produced at the Roger Reed State Salmon Hatchery was increased from 132,883 in 1989 to 333,000 in 1990. A total of 273,500 fry were stocked into the Westfield River Basin, while 32,000 were stocked into the Deerfield River Basin. A total of 27,500 fry were stocked into the Mill River Basin in Hatfield, Massachusetts as part of a research study being conducted through the University of Massachusetts. A survey of Atlantic salmon habitat on the Westfield River continued for the second year, in 1990. This represents approximately 70% of the suitable salmon habitat in the basin. Parameters measured as part of the survey include substrate typing, stream width, stream depth and gradient. These measurements were collected at 200 foot intervals along the streams being surveyed. Analysis of this data has revealed that there is sufficient habitat to stock over 500,000 salmon fry into the Westfield River Basin.

Merrimack River

A total of 243 Atlantic salmon were trapped at the Essex Dam fishlift in Lawrence during the 1990 spawning migration. This is a significant increase over the 85 salmon recovered in 1989. The number of American shad and blueback herring that passed through the fishlift totaled 6,023 and 254,242 respectively. Primary emphasis for Division personnel was staffing the Essex fishlift. Staffing of Pawtucket Dam fishlift and fishway in Lowell, was minimal. Counts from the fishlift are minimum counts since both the fishlift and fishladder were operated at times when no counter was present. Only 443 shad and 9,888 blueback herring were recorded at the facility during 1990.

Other Division activities on the Merrimack River Anadromous Fish Restoration included participation on the Technical and Policy Committees. The primary focus of these groups activities centered around the development of the domestic salmon release proposal in order to create a sport fishery in the

Merrimack River prior to the opening of a sport fishery for sea run salmon.

Fish Kill Investigations

The Section implemented a statewide fish kill response protocol under an interagency Memorandum of Understanding (DPH, DEP, DFA, MDFW) signed in October, 1988. Two Districts (Western and SE) and Westboro Field Headquarters were equipped with fish kill response equipment and sampling gear. Training sessions were conducted and the DFW fish pathologist received additional training at the U.S.F.W. Fisheries Academy.

The Section investigated 55 fish kills totalling 41,000 fish of which 34 kills required a field investigation. Major fish kills during this period included Chicopee Brook in Monson where 12,300 fish died as a result of a cyanide release and Arcade Pond in Northbridge where 21,000 fish died as the result of an algae bloom complicated by an overdose of copper sulfate. Sixty-nine percent of the kills proved to be due to natural causes.

Quabbin Reservoir

Seventy-five lake trout from Quabbin Reservoir qualified for Sportfish Award pins (7 lbs. or larger) in 1990. The ten heaviest fish ranged from 14 to 18 lbs. The annual Quabbin creel survey revealed that an estimated 33,623 boat anglers fished 217,043 hours and caught 36,012 fish. The catch consisted primarily of lake trout, smallmouth bass, largemouth bass and white perch. In early May, the Division released some 28,600 landlocked salmon fingerlings cultured at the state's Roger Reed fish culture facility in Palmer, MA. This landlocked salmon stocking is a put-grow-take management program started by the Division 1980.

The Division acquired 7,500 landlocked salmon eggs from Winnipesaukee fish and another 7,500 from East Grand Lake, Maine fish for next year's stocking. The two strains will be compared for growth and survival. The total number of salmon stocked in Quabbin next year will be cut back in order to better match forage supply and predator demand.

The Division also investigated levels of aluminum in relation to wind direction and velocity, on smallmouth bass spawning shoals at Quabbin during the spawning period. This followed a study of aluminum levels in tributary streams which was conducted in conjunction with an investigation of smelt egg mortality and an increase in aluminum levels in Quabbin sediment core samples. The present study revealed elevated aluminum levels (0.1 - 0.5 mg/l) on all shoal areas except wind-protected bays when the wind was on shore. The same wind-exposed shoals had aluminum levels under 0.1 when the wind was offshore suggesting that the source of the aluminum was inshore sediments stirred up by wave action. As pH was generally above 6.4, elevated aluminum levels would not be expected to impact smallmouth bass spawning but *would* be expected to impact smelt egg survival depending on wind direction and intensity.

Environmental Review and Assessment

The fisheries staff reviewed and commented on a variety of projects including the Marone Dump on the Ware River in Barre; Atomic Yankee, Rowe; Mass.Aquafuture, Montague;, Nyanza Chemical Superfund Site, Ashland. Section staff reviewed National Pollution Discharge Elimination System (NPDES) Permit specifications and compliance monitoring data. They commented to EPA on many of the major waste water treatment plants and industrial dischargers on rivers associated with the Anadromous Restoration Project including the Connecticut, Merrimack, Deerfield, Westfied, Chicopee, and Concord rivers. Staff members worked with the Department of Environmental Protection in its revisions of water quality criteria in an effort to update the coldwater criteria and water quality criteria of rivers involved in MDFW's Atlantic salmon restoration effort. Staff also began development of MDFW guidelines for stocking trout in contaminated waters.

Hatcheries

During fiscal 1990, the hatchery system produced some 687,523 fish weighing 436,561 pounds. At present, trout over twelve inches long comprise approximately 50% of the total trout production. Palmer hatchery produced 50,250 landlocked salmon, 7,970 atlantic salmon, 11,600 northern pike and 1,900 tiger muskies for the escocid program (see Table, page 9).

Fisheries Staff

Peter Oatis
Assistant Director for Fisheries
Joseph Bergin, Aquatic Biologist II
William Easte, Aquatic Biologist I
David Halliwell, Aquatic Biologist II
Richard Keller, Aquatic Biologist II
John Lindenberg, Aquatic Biologist II
Robert Madore, Aquatic Biologist II
Mark Tisa, Aquatic Biologist II

Hatchery Staff

Bitzer Fish Hatchery
Ralph Taylor, *Manager*
Karl Hansen
Chester Kopinto
John Kopinto
John Williams

McLaughlin Fish Hatchery
James Hahn, *Manager*
Jennifer Ayre
David Basler
Edward Bolduc
Alan Jackson
Annette Kucharczik
William Mikelk
Joseph Skowron
John Sousa

Sandwich Fish Hatchery
Lloyd Raymond, *Manager*
Alan Aittaniemi
Antone Fernandes, Jr.
Lawrence Hollings
Arthur Leonard
Vernon Lopez
George Moore

Palmer Fish Hatchery
Michael Masley, *Manager*
Robert Lucas
Arthur Pellegri, Jr.

Sunderland Fish Hatchery
Frank Pietryka, *Manager*
John Besse, Jr.
Douglas Isles
Edward Siwicki
Thomas Smith

FISH PRODUCTION FIGURES
FY90

	1-4	6-9	9+	12+	# Fish	Weight(Lbs)
McLaughlin						
Rainbow	-	-	152,706	152,706	146,846	
Brook	-	-	57,091	33,901	90,992	57,657
Brown	-	-	500	-	500	186
Totals	**-**	**-**	**57,591**	**186,607**	**244,198**	**204,689**
Sunderland						
Rainbow	-	-	18,625	47,136	65,761	53,619
Brook	-	-	24,625	13,489	38,114	23,974
Brown	-	34,849	-	27,553	62,402	40,002
Totals	**-**	**34,849**	**43,250**	**88,178**	**166,277**	**117,595**
Palmer						
N. Pike	3,200	-	8,400	-	11,600	1,000
Atl.Sal.smolts	-	7,200	-	510	7,710	2,244
Tiger muskies	-	-	1,900	-	1,900	127
Atl.Sal.Brdstk	-	-	-	260	260	812
Landlocked Sal.	19,900	30,350	-	-	50,250	6,739
Totals	**23,100**	**37,550**	**10,300**	**770**	**71,720**	**10,922**
Montague						
Rainbow	-	-	40,700	21,800	62,500	48,219
Brook	-	-	13,955	-	13,955	6,053
Brown	-	26,025	-	16,468	42,493	21,824
Totals	**-**	**26,025**	**54,655**	**38,268**	**118,948**	**76,096**
Sandwich						
Rainbow	-	-	42,310	-	42,310	20,201
Brook	-	8,450	-	1,000	9,450	2,906
Brown	-	15,020	-	13,100	28,120	13,505
Sea-run brown	-	6,500	-	-	6,500	1,569
Totals	**-**	**29,970**	**42,310**	**14,100**	**086,380**	**38,181**
Grand Totals	**23,100**	**128,394**	**208,106**	**327,923**	**687,523**	**447,483**

WILDLIFE

Dr.Steven A. Williams
Assistant Director

Birds

Waterfowl

During the summer and fall of 1989, the DFW staff conducted the first full season of airboat nightlighting in four years, and thus was able to band 664 ducks and other marsh birds. Spring nest box banding at Fort Devens, Ayer, and bait trapping at the Stony Brook Audubon Sanctuary supplemented nightlighting bandings. A total of 473 wood ducks, 172 mallards, 14 black ducks, 5 mallard x black hybrids, 31 green winged teal, 9 blue winged teal, 1 pintail, and 1 hooded merganser were banded. Species incidental to duck trapping included 1 Canada goose, 3 common moorhens, 1 Virginia rail and 10 soras. The Great Meadows and Parker River National Wildlife Refuges also banded waterfowl, bringing the total number of waterfowl banded preseason in Massachusetts to over 1300 ducks.

The third year of resident Canada goose banding was highly successful with 2,050 geese banded at 33 sites across the state, from Martha's Vineyard to the Berkshires. This project allows the Division to assess the impact of the experimental late resident goose season on local birds. This year 2,040 permits were issued and 1,060 hunters actually hunted during the late season, harvesting 1,582 geese. The late season is restricted to the coastal zone. This year, a record cold December caused some birds to leave the state;

27% of our band recoveries occurred out-of-state this year compared to 10% in 1988 and 1989. Unusually warm January temperatures, however, allowed geese from coastal areas to move to inland sites during the late season, reducing harvest opportunities.

The 1990 midwinter waterfowl inventory resulted in a count of 156,260 waterfowl. Black duck numbers (18,800) were down

12% from the 10 year average and Canada geese (8,930) were down 27%. Mallard (3,210), goldeneye (10,735), Bufflehead (12,940) and Eider (76,015) numbers were all substantially above average while mergansers (8,890) scaup (9,525), scoter (4,845) and brant (1,010) were all well below average.

Wood duck nesting studies continued during the spring and summer of 1990. Nest starts on 50 study areas were at an all time high with 419 starts in 658 boxes. The success rate was slightly lower than normal with 334 successful hatches (80%). A cold, rainy May, however, during the peak hatching period may have reduced brood survival and many unhatched eggs were found in the boxes. Airboat bandings during the summer revealed an age ratio for wood ducks of only 1.5 young per adult. Normal expectations are 2 or 3 young per adult.

The Atlantic Flyway waterfowl breeding survey entered the second year of a three year study with all the states from Virginia north to Vermont/New Hampshire participating. Approximately 1,500 plots one km.^{2} were surveyed, 134 of them in Massachusetts. In addition, the Massachusetts waterfowl project leader is heading up the project, providing direction to participating states and acting as a clearing house for the data collected. Results are being entered into a data base program and provided to statisticians with the U.S. Fish and Wildlife Service.

Migratory Bird Census:

Mourning Dove Census:

The number of calling doves on 8 dove census routes increased 12 percent from 1989 to 1990. The number on 3 long-term standardized routes decreased 3 percent over the same period.

Woodcock Census:

A woodcock census was conducted on 15 singing-ground routes between April 23 and May 15, 1990. Survey results showed a 5.9% increase in the Massachusetts woodcock breeding population index over 1989, and a 2.5% decrease in the Eastern United States Management Region.

Wild Turkey:

Wild Turkey Range and Harvest Evaluation:

The 11th Massachusetts spring gobbler hunt was held in May 1990, with the season divided into a one-week first segment and a two-week second segment. The open zone and the number of permits were the same as in 1989. A total of 7306 permit applications were received for the 1st period and 5785 for the 2nd period. A record kill of 791 turkeys was attained, with an overall success rate of 8.2%. The Berkshire county harvest was 391 (49.4%) with Franklin (140) second and Hampshire (95) third. Adult males comprised 559 (71%) of the take.

Winter trapping showed good results, despite erratic snow cover. A total of 43 turkeys were captured during February. Twenty (7M, 13F) were translocated to Ashby, Middlesex County, and 22 (9M, 13F) to Sutton, Worcester County.

Preparations were begun for the state's first modern-day fall turkey season, which will be held in November 1990.

Pheasants:

During FY 1989 a total of 44,656 Ringnecked pheasants were released statewide. 23,479 were reared at the Ayer State Game Farm.

Fifteen thousand-seventy-one (15,071) were purchased from a contract vendor.

These birds were released as follows:

37,995 were released during the fall by DFW staff

466 were released as broodstock

6,106 were released to sportsmen's clubs participating in the pheasant rearing and release program

89 were retained for shows and exhibits

Pheasants released for hunting were distributed as follows (figures include birds released by clubs, field trials, etc.):

Southeast District	7,864
Northeast District	4,091
Central District	15,454
Conn. Valley District	12,007
Western District	5,250

A total of 48,108 Ringnecked pheasants were released statewide during Fiscal Year 1990. Thirty three thousand fifty four (33,108) were reared at the Ayer State Game Farm.

Fifteen thousand (15,000) were purchased from a contract vendor.

These birds were released as follows:

41,332 were released during the fall by DFW staff

6,722 were released to sportsmen's clubs participating in the pheasant rearing and release program

54 were retained for shows and exhibits

Pheasant's released for hunting were distributed as follows(figures include birds released by clubs, field trials, etc.):

Southeast District	8,928
Northeast District	4,588
Central District	16,534
Conn. Valley District	12,712
Western District	5,346

Falconry:

During FY 1990, the Division licensed 14 apprentices, 18 general falconers and 10 master falconers. The Division also issued 10 raptor propagation permits and 33 raptor salvage permits.

Mammals

Furbearers

The furbearer program is responsible for the management of and research on twelve species of wildlife. These species include weasel, skunk, fox, coyote, beaver, otter, fisher, raccoon, opossum, bobcat, muskrat, and mink. Massachusetts furbearers are abundant and widely distributed throughout the state. The values of the Commonwealth's furbearer resource are diverse. Furbearers afford ecological, recreational, economic, educational, and aesthetic opportunities to individuals thoughout the state. The management of furbearers presents many challenges.

The furbearer management program uses regulated hunting and trapping as management tools in the harvest of these renewable resources in the Commonwealth. The combination of these two techniques are used to:

1. Control problem animals
2. Reduce habitat degradation
3. Provide recreational and economic opportunity
4. Reduce competition within populations
5. Reduce crop and property damage

The Massachusetts Division of Fisheries and Wildlife regulates the trapping of furbearing animals. Massachusetts has very complex and restrictive laws and regulations that affect trapping, including:

1. Mandatory licensing of trappers
2. Mandatory trapper training
3. Restrictions on the size of traps
4. Restrictions of types of traps
5. Mandatory, regular checking of traps
6. Restricted seasons for trapping
7. Restricted areas for trapping
8. Mandatory identification of traps indicating the name and address of the trapper.

Pelt Sealing: Pelt sealing is used to gain harvest information and data on the distribution of beaver, otter, red fox, gray fox, bobcat, coyote, and fisher statewide. Additional biological information is gathered on the sex and age of the trapped animal and the method of harvest employed. During the 1989-90 harvest season the Division sealed 1,942 pelts. In addition to requiring that pelts be sealed, the Division requires hunters and trappers to turn over the carcasses of particular harvested species which are collected and examined. 402 specimens were delivered to the Division for laboratory examination during FY 1990.

Furbuyer Reports: Individuals receiving the pelts of wild animals must be licensed by the Division. These furbuyers are required to report the numbers and species of pelts they receive through purchase, barter, or gift each year. In 1989-90, 28 licensed furbuyers submitted annual reports for 13 various species of animals and represented a total of 7,541 pelts. These pelts are typically used in making garments and other consumer products, and are a contribution to a 8 billion dollar/year nation wide industry.

Black Bear

Black Bear Distribution and Harvest Investigations:

A record total of 1410 bear hunting permits were issued for the 1989 hunting season. A total of 29 bear were taken during the 2-week split season, including 23 during the 1st segment and six during the 2nd segment. Fourteen males and 15 females were taken in Berkshire (10), Franklin (12), Hampden (2), and Hampshire (5) counties. Eight road kills, four illegal kills, and one depredation kill were recorded. A total of 29 bear complaints were received, primarily beehive damage (8), trash raiding (6), and bird feeder raiding (4).

White-tailed Deer

Division biologists were involved in research, management and educational activities that reached many citizens of the Commonwealth and led to better understanding and control of the state's estimated 50,000 white-tailed deer.

The major research effort was aimed at analyzing herd growth and conditions across the state. During the 1990 deer hunting seasons approximately 70,000 hunters harvested 6,901 deer. Division staff collected biological data on nearly 45% of the deer harvested. Yearling male

antler beam diameter measurements and deer weights indicated that the increasing herd size has not affected the good condition of deer or their range.

In an effort to better understand deer population dynamics, the deer project leader developed a computer-based population model. The model is currently being tested by biologists and managers throughout the Northeast. Following testing and modification, the model will be used as a management tool that will provide objective analysis of deer populations based on harvest and age data collected during the hunting seasons. The Division also sponsored a fawn mortality study (recently completed) through the Massachusetts Cooperative Wildlife Research Unit at the University of Massachusetts.

Deer management goals have been established for each of the 14 deer management zones. These goals were developed in order to control deer populations at levels compatible with human needs and desires, as well as ecological conditions within each zone.

The basis of deer management in this state is the control of the harvest of female deer during the shotgun deer season through the antlerless deer permit system. Approximately 38,000 sportsmen applied for antlerless permits and the Division issued 12,540 permits in total. The $5.00 permit fee generated $62,700 toward costs associated with managing wildlife resources. Archers and primitive firearms hunters contributed in excess of $135,000 to Division programs through the purchase of a stamp that allows them to hunt during these special seasons. In addition, deer hunters in Massachusetts contributed approximately $35 million to the state's economy through purchases associated with hunting (i.e., hunting equipment, transportation, food and lodging).

Forestry

Progress was made on each of the forestry program's three objectives, which are:

1) Build an inventory data base for each wildlife management area (WMA), and established property boundary lines in the field.

2) Use inventory data to design and carry out commercial forest cutting operations that improve wildlife habitat on, and human access into each WMA.

3) Determine the response of wildlife populations to forest cutting operations.

A major commercial forest cutting operation was completed on a portion of the Hy Fox WMA in Chester. This operation was conducted by Gagnon Brothers Logging of Goshen between 1986 and 1990, and removed more than half a million board-feet of saw timber and an additional 1,200 cords of firewood from a total of 150 acres. The operation included 11 separate clearcuts covering 29 acres, and 4 areas of shelterwood cutting covering 121 acres. Individual clearcuts ranged in size from 1.5 - 5.0 acres, and produced valuable wildlife habitat in the form of early successional stage forest, which had been totally lacking on the WMA prior to this operation.

Proceeds from this completed operation provided $40,000 worth of services on the WMA. A total of $35,500 was spent on access road construction, and $4,500 was spent on establishment of wildlife openings and site preparation to enhance regeneration of red oak on the WMA. All services were provided by local contractors. Timber and firewood were processed at a local sawmill. All of this helped to stimulate the local economy while meeting the goal of providing improved wildlife habitat.

A new contract for a commercial forest cutting operation on the Quacumquasit WMA in Brookfield was awarded to LeClerc & Son Logging of Belchertown after a public, competitive bid. A total of 250,000 board feet of white pine timber on 25 acres was sold in exchange for construction materials and heavy machinery to build 1,200' of access road into the WMA.

A 600 acre section of the Hy Fox WMA in Chester was censused for ruffed grouse, wild turkey, and woodcock in April, 1990, and a 1,000 acre area was censused for breeding songbirds in June, 1990. A total of 8 drumming ruffed grouse were recorded in 1990 for an average density of 1.3 drumming males/100 acres, which is an increase over 1986-89 densities of <1 drumming male/100 acres. In 1990, 4 singing male woodcock were recorded, compared with 0 in 1986-89. Six gobbling male wild turkeys were recorded in 1990, compared with 2 in 1989, 1 in 1988, and 0 in 1986-87.

The songbird census has indicated that the diversity of bird life on the WMA is increasing. A complete 1,000 acre census was conducted in 1986, 1988, and 1990, and yielded a total of 62, 67, and 71 bird species, respectively. Species which have increased noticeably include the chestnut-sided warbler, common yellowthroat, downy woodpecker, great-crested flycatcher, Louisiana waterthrush, northern waterthrush, red-winged blackbird, rose breasted grosbeak, white-throated sparrow, and wood thrush. Two species, the blackburnian warbler and Swainson's thrush, appear to be declining.

The forestry program continues to benefit from interaction with the Massachusetts Cooperative Wildlife Research Unit and the University of Massachusetts Department of Forestry and Wildlife. Three undergraduate students were hired through the Research Unit, and conducted a forest inventory on 1,455 acres on the Swift River WMA in Belchertown and Ware (1,100 acres), the Quacumquasit WMA in Brookfield (150 acres), the Hiram Fox WMA in Worthington (120 acres), the Bitzer Hatchery in Montague (75 acres), and the Peru WMA in Peru (10 acres).

A total of 11.8 miles of woodland boundary line was marked, including 5.1 miles on the Swift River WMA in Belchertown and Ware, 2.7 miles on the Peru WMA, 1.7 miles on the Hiram Fox WMA in Worthington, 1.1 miles on the Savoy WMA, 0.8 miles on the Bitzer Hatchery in Montague, and 0.4 miles on the Kelly WMA in Chester.

Work planned for the next fiscal year includes forest inventory and boundary work on the High Ridge WMA in Gardner, and initiating a commercial timber sale on the Fox Den WMA in Worthington.

Massachusetts Cooperative Wildlife Research Unit:

Movements and Mortality of White-tailed Deer Fawns: Thomas A. Decker

Field studies and data collection have been completed.

The final analysis of data is being conducted and the final report is in preparation.

Response of Black Bears to Habitat and Land Use Changes in Massachusetts: David P. Fuller

Capture, monitoring, and den checks of radio-collared black bears were continued in the Conway-Williamsburg study area. This area has a higher proportion of urban development and agricultural land than most of the black bear range in western Massachusetts. To obtain a better estimate of the bear population, a second study area was established in the Savoy-Hawley area and intensive capture efforts began there in the summer of 1989. A total of 22 new captures and 4 recaptures in Conway-Williamsburg. Forty-four bears were being radio-monitored as of 6-30-90, including 21 in Savoy-Hawley and 23 in Conway-Williamsburg.

Sixteen newborn cubs from eight litters were observed during February and March of 1990. Average litter size for 1990 was 2.0.

A record number (10) of marked bears were killed in 1989-90, including five males and five females. This increase relates to:

(1) cessation of a request to refrain from shooting collared bears
(2) changes in collar color, which makes that marker less visible
(3) an increase in marked bears in the population
(4) an increase in bear hunters
(5) good hunting conditions in 1989.

Bear location data were input to the GIS system program ARC/INFO at the University of Massachusetts from computer files supplied by former graduate student Kenneth Elowe. These data were combined with Massachusetts habitat data from the MassGIS. A complete array of all bear location data is presently being compiled and will be transferred to ARC/INFO when available and edited.

Furbearer Population Models in Wildlife Management: Thomas J. Mahoney

Nine models were identified from the literature which dealt specifically with the five furbearers of interest to the Division. Two were concerned with bobcat, five with coyote, one with beaver, and one with fisher. A tenth model was more generalized and could be applied to all five species.

Questionnaires were mailed to 91 wildlife agencies, of which 65 (71%) have been returned. Twenty-three of the 65 respondents indicated that they used, knew of, or were developing furbearer population models. Of the 28 models used by these respondents, 27 were computer-based or mathematical and one was a conceptual model.

The next step will be to review and test the applicability of the various models to furbearer management in Massachusetts.

Movements, Habitat Selection, and Population Characteristics of River Otters in Massachusetts: Douglas G. Newman

The final report was completed. Freshwater habitats used by river otters included three wetlands systems (palustrine, lacustrine, and riverine) with 11 subdivisions within these systems. Preferred sites for otter latrines (indicative of habitat use) included small peninsulas, isthmuses, mouths of permanent streams, and sites with large conifers and beaver bank dens and lodges. Habitat management strategies should encourage beaver populations as well as to consider availability of mature conifers along wetland shoreline.

Wildlife Staff:
Steven A. Williams
Assistant Director for Wildlife Research
Robert Bellville
Richard Burrell
James E. Cardoza
Thomas Decker
Thomas Early
Marcia Hartleb
H W Heusmann
John Scanlon

Game Farm Staff:

Ayer Game Farm
Stephen Foster, *Manager*
Robert Bennett
Mark Brideau
Richard Donohue

Sandwich Game Farm
John Prouty, *Manager*
Jack Almeida
Robert Gallagher
Ernest Green
Kenneth Weaver

Natural Heritage & Endangered Species Program

Dr. Thomas W. French
Assistant Director

Legislation

A bill that required the addition of a contribution line for endangered wildlife conservation to the state's corporate tax forms passed in July, 1989 as part of the FY90 Budget. The contribution line was subsequently added to all the twenty or so different types of corporate income tax forms as of January, 1990. Approximately 100,000 corporations file annually in Massachusetts although about 40,000 of them pay the minimum tax. No results of the success of the "corporate checkoff" had been received by the end of the fiscal year.

A bill to change the name of the Nongame Wildlife Fund to the Natural Heritage & Endangered Species Fund and to require that all interest on the balance in the fund be deposited into the fund was filed in November by Representative Robert Durand. The text of this bill was included in the House-passed budget in June, 1990 but it was not included in the Senate budget. At the end of the fiscal year the prospects looked good for passage of this bill as part of the final FY91 Budget.

The bill to protect endangered plant and animal species in Massachusetts nearly passed in 1989. The bill was "passed to be engrossed" by both the House and Senate but it failed to receive final enactment on the very last day of the session. In 1990 the bill continued to receive a lot of attention. It was reported out of the legislature's Natural Resources Committee in April with several amendments. The bill, which received a lot of media coverage the previous year, was a top legislative priority of the environmental community.

The Cape Cod Commission bill was passed in 1989 and was approved by Barnstable County voters in March 1990. The bill, which included language recommended by Natural Heritage & Endangered Species Program staff concerning endangered species habitat, provides land use planning and regulatory controls for Cape Cod.

A bill to establish a state system of Nature Preserves was passed this year (Chapter 652 of the Acts of 1989). The bill establishes a Council to advise the Division of Fisheries & Wildlife in implementing a Nature Preserve system for lands under the control of the Executive Office of Environmental Affairs.

Nongame Advisory Committee

This committee, formally established as part of the 1983 income tax "checkoff" legislation, met monthly during the year. In addition to providing advice to the Program on ongoing operations, the Committee also worked on the following issues:

Revision process for the list of Endangered, Threatened, and Special Concern Species

Regulation to establish a Domestic Animal List (321 CMR 2.05)

Bill to allow domestic ferrets as pets (did not pass)

Bill to change the name of the Nongame Wildlife Fund to the

Natural Heritage & Endangered Species Fund in order to be consistent with the name of the Program (passed 7/90)

Review of the Endangered Species bill

Review of proposed changes to the rare species list

Review of the annual Small Research Contract proposals (26 proposals were reviewed).

Review of the Natural Heritage & Endangered Species Program's annual budget

Review of the annual promotional strategy for the Fund.

Rare Species List Changes

A dozen changes to the Commonwealth's official rare species list (321 CMR 8:00) were approved by the Fisheries & Wildlife Board in December and became effective in January. The specific changes made to the list were: three additions (e.g. Atlantic Sturgeon); two deletions (e.g. Osprey); four taxa whose endangerment status on the list was changed; and three nomenclature changes.

During the fiscal year the U.S. Fish & Wildlife Service listed two invertebrate species that have occurred in Massachusetts:

> American Burying Beetle (Nicrophorus americanus), August, 1989; and
>
> Dwarf Wedge mussel (Alasmidonta heterodon), April, 1990.

This is the first listing under the federal Endangered Species Act of rare invertebrate species that are native to the state and both were listed as "Endangered". These two species have been the subjects of recent inventory efforts funded by the Natural Heritage & Endangered Species Program.

Inventory, Research & Species Management

Small Research Contracts Program

In 1989 the Program received 24 proposals for inventory and research projects under the Small Research Contracts program (4 natural community, 7 plant, and 13 wildlife proposals). Of these, 16 projects were selected for funding for a total expenditure of $14,727. These projects are listed below. During the winter of 1990, 26 proposals (1 natural community, 8 plant, and 17 wildlife proposals) were received requesting funding for the 1990 field season: they will be discussed in the Program's fiscal year 1991 annual report.

Small Research Contracts Funded in 1989:

Wildlife

V. Carpenter (CCMNH): Rare Odonates

P. Nothnagle: Puritan Tiger Beetle

M. Goldstein: Martha's Vineyard Invertebrates

M. Mello (Lloyd Center): Papaipema Moth

M. Mello (Lloyd Center): Regal Fritillary

E. Strauss: Piping Plover

B. Dykema: Rare Salamanders

Plants & Natural Communities

F. Caldwell: Brackish Marsh study

N. Drake: Long's Bulrush site

W. Patterson: Pine Barrens management

M. Roberts: Hairy Honeysuckle - Taxonomy

H. Art: Hairy Honeysuckle - Inventory

R. LeBlond: Cape Cod Rare Plants

E. Armstrong: Falmouth Rare Plants

M. DiGregorio: Bourne Rare Plants

T. Blau: Devil's Bit

Animal Inventory and Research

Birds

Piping Plover: As a result of the statewide census coordinated by the agency, a total of 137 breeding pairs of Piping Plovers were reported in 1989. The overall mean productivity in Massachusetts in 1989 was estimated at 1.59 chicks fledged per pair.

Terns: As in every year since 1977, Division personnel continued to coordinate a comprehensive statewide census of all four species of nesting terns in the Commonwealth. Common Tern numbers showed continuing improvement, breaking over the 10,000 pair mark and attained their highest level since 1970. A final total of 10,199 pairs were located at twenty-five stations, seven percent above 1988 results. Unfortunately, numbers of the endangered Roseate Tern slipped for a third consecutive year to 1,576 pairs, fully five percent below 1988. Nearly all these birds were concentrated at Bird Island in Marion, one of only two large nesting groups in the Northeast. Arctic Terns, a long-established peripheral nesting species, were found at three sites in 1989 aggregating only 15 pairs, down from 16 pairs a year earlier. The largest nesting group was eight pairs in Nauset Harbor, Eastham. Least Terns, probably the most opportunistic but also the most variable of our nesting species, were estimated at 2,233 pairs at forty-three stations in 1989, down 17 percent from 1988. Seven stations harbored over 100 pairs.

Bald Eagles: After releasing 41 young Bald Eagles in Massachusetts over the previous seven years, a major recovery milestone for the state was realized when two wild pairs of Bald Eagles successfully fledged 3 young in 1989. Two additional territorial pairs, including one at Turner's Falls on the Connecticut River, have been located which suggests that next year even more pairs will nest in the state. With the culmination of hacking and the beginning of wild nesting, the Division has entered a new era of eagle restoration and management. The successes of this year are the fruits of the hard work and dedication of a great many individuals and organizations committed to restoring nesting Bald Eagles to Massachusetts.

The mid-winter eagle count held on January 12, 1990 documented a total of 61 Bald Eagles and one Golden Eagle in the state. Of this total 33 of the Bald Eagles were immature birds and 28 were adults. As usual Quabbin Reservoir hosted the greatest number with 35 Bald Eagles (19 immature, 16 adult) and the one Golden Eagle. The second greatest number of Bald Eagles were counted along the Merrimack River which totalled 13 (10 immature, 3 adult).

Peregrine Falcon: Two pairs of Peregrine Falcons nested in the state, one in Boston on the John McCormack Post Office and Court House Building and the other in Springfield on the Monarch Place Building. The Boston pair fledged three chicks (2 males and 1 female) in 1989 but the female chick was killed within the first or second day when it flew into a reflective glass skyscraper a couple of blocks away. The Springfield pair bred for the first time this year producing two chicks (1 male and 1 female) which fledged successfully. This nest became well known to thousands of Springfield residents as a result of the local Continental Cablevision station placing a camera behind the window next to the nest and dedicating a channel for its viewing all day throughout the nesting period. As a result, Division staff were alerted and thus able to save one chick which was choking on a piece of food which had become lodged in its throat.

Common Loon: Eight territorial pairs of Common Loons were located on four lakes in 1989. Five pairs were located at Quabbin Reservoir which continues to be the stronghold for nesting loons in Massachusetts. Single pairs were found at Wachusett Reservoir in Sterling, Bickford Pond in Hubbardston and at Upper Naukeag, Ashburnham. Division personnel and volunteer cooperators monitoring the nesting estimated a total of 8 chicks fledged in 1989, thus the production was 1 chick fledged per nesting pair. Massachusetts is situated at the very southern fringe of the Common Loon's nesting range. After an absence of many years, Common Loons began nesting in Massachusetts again in 1975 and the number of nesting pairs has been slowly increasing in the state since then.

Osprey: Of 179 occupied nests, 114 successfully fledged 231 chicks. Although the number of occupied and successful nests increased by 27 and 4 respectively over 1988 figures, the number of chicks fledged declined by nine birds. Prolonged rains in June coupled with avian and mammalian predation resulted in the slight drop in overall production. Three Osprey chicks were found to have died in their nests as a result of becoming entangled in monofilament line. The Westport River estuary and Martha's Vineyard Island supported 73% of the state's nesting Ospreys.

Reptiles & Amphibians

Plymouth Redbelly Turtle: During the summer and fall of 1989 the following research and management activities were undertaken for the Redbelly

Turtle: 1) trapping in Crooked Pond to monitor the survivorship of resident turtles; 2) location and protection of nests at Federal Pond; and 3) monitoring the hatch of Federal Pond nests, releasing a portion of these turtles directly to the wild and retaining some for "headstarting". Fifty-nine Redbelly Turtles were captured in Crooked Pond between 8 September and 28 October 1989, and 29 of these were recaptured at least once. A capture/recapture estimate of 90 individuals in Crooked Pond was developed. A total of 26 nests were located at Federal Pond and protected with mesh cages. An additional seven nests were found raided by predators. During September and October 1989 a total of 211 hatchlings emerged from the 26 protected nests. Of these, 116 hatchlings were released directly into Federal Pond and 95 were retained for headstarting by six cooperating organizations. Over the winter four hatchling turtles died but the remaining 91 grew well and were released back into the wild during May 1990.

Invertebrate Animals

The Program was contracted by the National Park Service to conduct inventories of the Cape Cod National Seashore for rare invertebrate wildlife. Inventories were conducted in 1989 by the following individuals:

V. Carpenter (CCMNH): Odonates (dragonflies & damselflies)

P. Nothnagle: Tiger beetles

M. Mello (Lloyd Center): Lepidoptera (butterflies & moths)

D. Smith: Rare aquatic invertebrates

For the fourth year through the Small Research Contracts Program, the Program supported rare dragonfly inventories by Virginia Carpenter of the Cape Cod Museum of Natural History. Three new populations of the Barrens Bluet damselfly and three of the New England Bluet were discovered on Cape Cod, and three dragonfly species were added to the list of Cape Cod odonata.

Northeastern Beach Tiger Beetle: One of the year's most exciting finds was the rediscovery in New England of the Northeastern Beach Tiger Beetle (Cicindela dorsalis dorsalis) on Martha's Vineyard in August of 1989 by Tim Simmons, then director of the Sheriff's Meadow Foundation and a recipient of past Small Research Contract awards. At the time of this rediscovery this species was about to be proposed by the U.S. Fish & Wildlife Service for listing under the federal Endangered Species Act.

American Burying Beetle: In preparation for a possible reintroduction effort, surveys of burying and carrion beetles were conducted in 1989 on Penikese Island (a wildlife sanctuary of the Division of Fisheries & Wildlife) during three trips to the island totalling eight trap nights between June 30th and August 27th to determine if the rare American Burying Beetle (Nicrophorus americanus) was still present. This species had been previously recorded from this island in 1923 and 1947. Over 600 beetles representing 6 species were captured in pit fall traps, however, no American Burying Beetles were discovered as a result of this effort.

Plant Inventory Highlights

Some highlights of the the 1989 field season are listed below:

° Barbed Bulrush (Scirpus ancistrochaetus), a candidate for listing under the federal Endangered Species Act, was rediscovered in the state during July 1989 for the first time since 1928;

° New England Boneset (Eupatorium leuocolepis var. novae-angliae), another federal candidate species, was discovered on Cape Cod for the first time ever by Mario DiGregorio. This Coastal Plain pond species is endemic to southeastern Massachusetts and Rhode Island;

° Few-flowered spike sedge (Eleocharis pauciflora), a new native plant species for the state, was discovered in a Berkshire County limey fen. This species is disjunct from northern New England;

° Narrow-leaved Verbena (Verbena simplex) was documented on Mt. Tom for the first time in over a hundred years by

Andrew Williams;

° Hairy beard-tongue (Penstemon hirsutus) was rediscovered on a limestone cobble;

° Houghton's Umbrella sedge (Cyperus houghtonii) was rediscovered in the state under Red Pine trees;

° Small-flowered Agrimony (Agrimonia parviflora), a new state record, was discovered by Pam Weatherbee;

° Important discoveries were also made for the following species: Purple Milkweed, Hairy Wild Lettuce, Northern Bedstraw, Sessile Water-speedwell, and Small Dropseed Grass.

Natural Community Inventory, Research & Management

Program staff continued to be involved in vegetation management projects as members of prescribed burning crews for management and research projects. A long term project to control the exotic grass Phragmites overgrowing a rare plant at a Coastal Plain pond was begun with a presentation to the Bourne Conservation Commission, owners of the land. Program staff, the Bourne Conservation Commission, and a local garden club later met to cut and remove the Phragmites. Monitoring transects were established to allow future comparison of the current extent of the aggressive plant and the effects of cutting it. Other management projects included the ongoing monitoring of vegetation at the Katama Plains Conservation area where burning, mowing, and control plots are being compared. Sampling plots at the Mashpee Pine Barrens, a DFW rare species acquisition, were established. At Schenob Brook in Sheffield, one of the best examples of a calcareous fen in Massachusetts, the staff ecologist participated in an annual monitoring of potential expansion of shrubs into the open areas preferred by a rare turtle. Inventory projects included visits to: Coastal Plain Pond Shore communities in Barnstable and Plymouth Counties; Old Growth in DEM's Mohawk Trail and Monroe State Forests; floodplain forests; a barrier beach in Barnstable; Atlantic White Cedar Swamps in several towns; and a variety of acidic bogs and fens.

Land Protection

Land Acquisition: In FY90 the Division of Fisheries & Wildlife acquired six properties totalling 251 acres to protect endangered species habitat. The money to acquire these properties, $545,000, came from the 1983 and 1987 open space bond authorizations. The acquisition of four of the parcels were negotiated on the Division's behalf by The Nature Conservancy. All but one of the acquisitions are adjacent to existing town or state conservation lands. The parcels acquired were:

Town	**Significance**	**Acres**
West Stockbridge	botanically rich hardwood forest	84
Leverett	botanically rich hardwood forest	90
Clinton	Black Oak savanna along Nashua River	42
Plymouth	Coastal Plain kettle pond	15
Mashpee	Pitch Pine barrens with wetlands (2 parcels)	15 & 5

Nature Preserves: The Secretary of the Executive Office of Environmental Affairs (EOEA) appointed the seven member Nature Preserves Council and added Metropolitan District Commission, Department of Environmental Management (DEM), and EOEA representatives as Agency Associate Members. The first three monthly meetings were held to discuss the establishment of a Nature Preserve system for EOEA lands and a brief initial report to the Governor was filed May 1st, as required by the legislation.

Natural Heritage Areas Registry and Other Land Protection Activities: Program staff worked with DEM in erecting barriers and signs to prevent motorized vehicles from continuing to damage the shores of several important Coastal Plain ponds in Myles Standish State Forest. Program staff arranged a trip for three of Nantucket's selectmen to visit the rare species habitat that many in town did not realize that they owned on Muskeget Island. A registry visit to Sandy Neck in Barnstable with members of the Governing Board and the beach manager was made in June.

Program staff helped organize a community cleanup during the Earth Day weekend in April that removed over 600 tires and many truck loads of refuse from the Hockamock Swamp in the Raynham/ Bridgewater area. After the cleanup a road that traverses this important wetland was gated and closed to motor vehicle traffic. At 5000 acres, the wetland, which is largely owned by the DFW, is the largest forested wetland in southern New England and provides habitat for 13 state listed rare species. The Program supported the nomination of the Hockamock Swamp as an Area of Critical Environmental Concern (ACEC) and it was so designated in February 1990.

The Program also supported the nomination of the Schenob Brook Wetlands in Sheffield as an ACEC. This area contains some of the best calcareous wetlands in the state and provides habitat for 38 state listed rare species.

During this fiscal year Program staff also:

° assisted with the trash cleanup of Mary Dunn pond in Barnstable that was organized by The Nature Conservancy;

° helped organize a cleanup by students of a new Division property along the Connecticut River in Northampton;

° worked with Division District staff in installing a gate at a new DFW acquisition in Plymouth.

Environmental Review

Wetlands Protection Act Reviews

Program staff worked with town conservation commissions and personnel from the Department of Environmental Protection (DEP) on 502 project reviews (Appendix A's) during calendar 1989 to assess impacts to rare wetlands wildlife habitat and to suggest mitigation measures. Forty-eight vernal pools were "certified" by the Program during the calendar year. Certification provides protection to vernal pool habitat if they occur in an area under the jurisdiction of the Wetlands Protection Act. The Wetlands Wildlife Biologist worked with the Department of Environmental Management in reviewing Forest Cutting Plans in Estimated Habitat areas and several staff members worked with DEP in developing a policy regarding rare wetlands wildlife protections under the Wetlands Protection Act.

Other Environmental Reviews and Information Requests

A new filing system for all project reviews was developed by the Program and implemented. The sequential project numbering system with a geographical cross reference index provides several file management benefits.

Language stating that solid waste facilities in Massachusetts should be sited in such a way that there will be no impacts to endangered species were incorporated into the Department of Environmental Protection's Solid Waste Facility Siting Regulations (310 CMR 16.00) at the recommendation of the Program.

The Program worked with the U.S. Fish & Wildlife Service on their Northeastern Coastal Areas Study by providing maps of the locations of regionally rare species for all of southeastern Massachusetts. In addition, maps of the high priority rare species habitat areas on Cape Cod were provided to the Association for the Preservation of Cape Cod for use in printing land use planning maps.

Data Management

Six hundred seventy two (672) new or modified "element occurrence" records were entered into the data base. For the first time, the Program used the state Geographic Information System to produce 5 new and 91 revised maps for the 1990 Atlas of Estimated Habitats of Rare Wetlands Wildlife, which includes 682 estimated habitat areas. The boundaries of Estimated Habitat areas were digitized and then 8 and 1/2 x 11 mylar prints were produced to overlay on reduced USGS topographic maps. Three hundred-fifty (350) rare wetlands wildlife atlases were printed and distributed. Office automation was greatly enhanced by the acquisition of five new computers and a letter quality printer.

During the month of July, Douglas Smith of the Zoology Department at the University of Massachusetts in Amherst worked in the Program's office in Boston on rounding out the Program's information about rare aquatic invertebrates. He also developed species fact sheets for 5 aquatic species.

Promotion, Publications, & Public Appearances

Ten new fact sheets for rare species were produced and a thirty-second television Public Service Announcement concerning beach nesting shorebirds was produced for release in the spring of 1991.

Fund promotion highlights:

° A thirty-second Public Service Announcement featuring Tip O'Neil, Curt Gowdy, and Kevin McHale was produced and distributed to television stations to promote the Nongame Wildlife Fund.

° An advertisement in 'GBH magazine was printed in the television station's February and March issues.

° Two hundred advertising cards were placed in Boston's subways with the title: "If you want to save something on your taxes, ... consider the Peregrine Falcon."

Media Appearances:

Program staff discussed Massachusetts endangered species issues while appearing on the following electronic media:

WBACH - half hour taped radio spot on endangered species bill (11/89)

WBUR - two minute taped radio interview on the endangered species bill (12/89)

WBZ - half hour taped radio interview (1/90)

Channel 7 - four minute taped spot on proposed endangered species bill (12/89)

Channel 2 - part of twenty minute taped spot about habitat loss in MA (4/90)

Channel 27 - half hour live program regarding rare species and Fund (5/90).

Conferences & Courses:

The Program co-sponsored several series of Vernal Pool workshops for the general public and for foresters. Program staff taught courses or classes at: New England Wildflower Society, Northeastern University, Smith College, and sat on a thesis committee at Tufts University.

Program staff presented over 20 talks to groups including: The Hoffman Bird Club, Naturalists' Club in Springfield, Allen Bird Club, Berkshire Conservation District, MSPCA outreach teachers, Friends of Belle Isle Marsh, University of Massachusetts' Wildlife Club, New England Raptor Migration Conference, Western Massachusetts Botanical Society, Appalachian Mountain Club of Cape Cod, Green River Watershed Association, Lloyd Center for Environmental Studies, Stony Brook Nature Center, Natural Resources Trust of Mansfield, Conservation commissions in Bourne, Dover, Holliston, and Stockbridge, DFW Board, DEP Wetland Protection Division, and Massachusetts Audubon Society.

Expert Witnesses:

Program staff members appeared as expert witnesses in three different trials. The cases involved the illegal possession of a ferret, a zoning situation concerning land in West Tisbury, and an eminent domain land taking by the town of Edgartown that involved rare species habitat.

Administration

Personnel

The Program's Rare Species Zoologist position, which had been vacant since October, 1988, was filled in June by the reappointment of Dr. Scott Melvin who had formerly held the position. The Program's secretarial position which had been vacant since September of 1988 was filled by Diane Lauber.

Budget

Contributions to the Nongame Wildlife Fund from individual income tax forms for 1988 as finally tabulated in November, 1989 totalled $331,095 which was received from 61,118 tax filers. Contributions for 1989 as tabulated through June 1990 totalled approximately $280,000 but were incomplete. Fiscal year 1990 appropriations were:

Nongame Management Line Item	$313,880
Natural Heritage Line Item	$172,414

A retained revenue line item for the Program was established for the first time in the FY90 state budget and $49,017 was authorized to be deposited into it. Thus, the total appropriation to the Program was $535,311, which represents represents a very slight increase over FY89. Actual FY90 expenditures by the Program were $466,185.

Natural Heritage and Endangered Species Advisory Committee:
Members:
Kathleen Anderson,
Caren Caljouw (resigned November 1989)
Marilyn Flor,
Fred Greeley,
C. Barre Hellquist,
Gwil Jones, chair;
Mark Pokras,
Doug Smith (appointed December 1989).

Associate members :
Abigail Avery,
Sharon Dean,
Chris Leahy,
Richard LeBlond (resigned January 1990),
William Patterson,
Michael Ross (resigned May 1990),
Douglas Smith (appointed full member December 1989)
Tim Simmons (appointed March 1990).

Program Staff:
Thomas French, Assistant Director
Henry Woolsey, Program Coordinator
Brad Blodget, State Ornithologist
Jay Copeland, Environmental Reviewer
William Davis, Eagle Project Leader
Margaret Goodwin, Data Manager
Diane Lauber, Program Secretary
Steve Roble, Wetlands Wildlife Biologist
Bruce Sorrie, State Botanist
Patricia Swain, Plant Community Ecologist
Annie Woolsey, Habitat Protection Planner

INFORMATION & EDUCATION

Ellie Horwitz
Chief, Information & Education

One of the most important roles of this Section is to provide the general public with information and news about wildlife, regulations, laws, recreational opportunities and issues of interest. To fulfill this task, all members of the Section devote time to responding to inquiries which arrive by mail and by telephone. By all measures it appears that the volume of both mail and telephone inquiries is increasing dramatically and this function is occupying significantly more staff time than in the past. In addition, staff members present informational programs in all parts of the state and many of them also prepare written copy for the news outlets and for use by media representatives.

Media Outreach

As part of this outreach the Section issued 26 press packets containing 107 individual press releases. As in the past, these items have been well received with newspapers printing an average of 318 articles a month which derive from Division press releases. This year the regular media offerings were supplemented by three major press events: the annual eagle survey, Dedication of a new federal research facility at Turner's Falls and Dedication of the Division's Westborough Field Headquarters Building as the Richard Cronin Building. On a particularly sombre note, during the course of the year the Section Chief was called upon to prepare obituaries for three close associates who were active in Division affairs until the day of their death:

Herman Covey, Manager,
Connecticut Valley Widlife District

Colton "Rocky" Bridges, Fisheries &
Wildlife Board Member

Peter Oatis, Assistant Director,
Fisheries

Annual Materials

As required by law, the Section prepared and issued Abstracts of Migratory Bird Hunting Regulations for 1990, Licenses, and Abstracts of the Fish and Wildlife Laws and Regulations for 1991. In an effort to streamline the publication process, the Abstracts of Migratory Bird Hunting Regulations was prepared directly on a computer enabling the Division to provide camera-ready copy to the designated printer. This eliminates the need for proofing materials sent by the printer. It will also facilitate making changes in coming years.

In addition to preparing the licenses and Abstracts, the Division also issues two stamps annually. The Archery/Primitive Firearms Deer Hunting stamp was, this year, selected through an open competition which was won by Edward J. Snyder of Springfield. Mr. Snyder's design will be reproduced on the 1991 Archery/ Primitive Firearms stamp. Selection of a design for the Massachusetts Waterfowl Stamp has been conducted through an open competition since 1974. This year the panel of judges awarded top honors to Racket Shreve of Salem, Mass. Following the competition, the Peabody Museum and the Division of Fisheries and Wildlife hosted a reception for invited dignitaries and their guests. All paintings entered into the contest were placed on display for two weeks at the Peabody Museum in Salem.

Exhibits

In March of 1990 Marion Larson joined the Section staff as an Information Officer with particular responsibility for exhibits and for educational programs. In the former capactity she spent the spring becoming acquainted with the Division's display materials and learning the proceedures involved in setting up and staffing exhibits for such exhibitions as the Eastern Fishing and Outdoor Exposition (Worcester) and the Springfield Sportsmen's Show (Springfield.)

The Section worked closely with Districts in setting up displays at the Hampden Co. Fair and at the Topsfield Fair. In addition to these shows, Division information was displayed at many smaller fairs which had booths staffed by District crews which used materials developed by I & E personnel.

Photography:

The Photography Section continued its task of providing extensive photodocumentation of Division projects and programs. In addition, photographer Bill Byrne worked closely with graphics and editorial staff of Massachusetts Wildlife to make sure that suitable photographs were available for each issue.

Recent photographs were reviewed and a selection of the best was chosen for use in the 1991 Massachusetts Wildlife Calendar. This program, now in its third year, has become increasingly popular and demand for the calendar is increasing.

Publications

The major publication of the Division of Fisheries and Wildlife is the quarterly Massachusetts Wildlife which now has a subscription base of 18,500. This is significntly below the number of subscriptions a year ago. As is the case with any subscription-based publication, promotion of new subscribers is a key element. Between 1987 and 1989 the recruitment of new subscribers was promoted primarily through mailings sent out by the Registry of Motor Vehicles. When the Registry discontinued these mailings in 1989, the impact on the magazine was significant. To recover the subscription momentum, new plans were designed to provide piggyback mailings which would be sent out with antlerless deer hunting permits and with turkey hunting permits. Additional materials were designed to serve as renewal forms and gift forms.

Due to concerns about fulfillment capability and depth at Specialized Fulfillment Services which has provided services fulfillment for the magazine since 1986, these operations were moved to Communication Data Services Inc.of DesMoines, Iowa. Considerable pre-planning was needed to ensure that magazine operations would continue smoothly through the transition period. Despite some initial concerns, the transition was made with no inconvenience to subscribers.

Existing publcations were reviewed and updated prior to reissuance when supplies ran low. Among these were:

- List of stocked trout waters
- A homeowners Guide to Bats
- List of Towns with Special Regulations Pertaining to Hunting
- Coyotes in Massachusetts
- MDFW Publications list

New Publications issued during the year were:

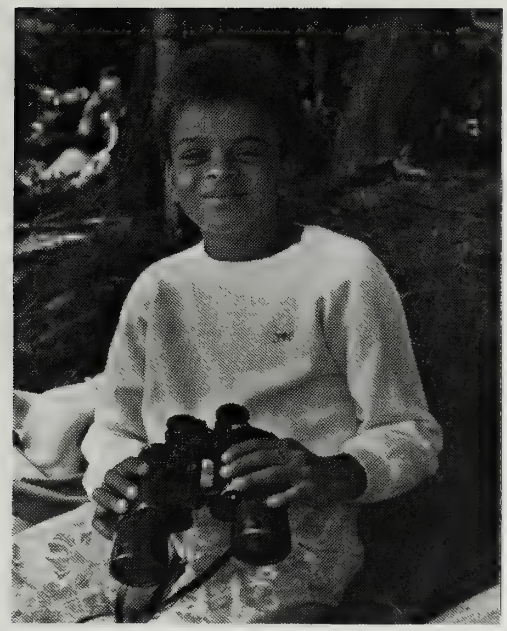
- Fish Massachusetts — a compilation of fishing information
- Pond Maps of Massachusetts — a set of 5 volumes of maps of ponds stocked with trout in the five Wildlife Districts. As this was a new venture, only 1000 sets were printed. Once it became known that these maps were available, the run on sales of this publication tied up clerical staff at the Division's Field Headquartres for more than two months.

Uniforms

In a continuing effort to make MDFW staff identifiable in the field, the Division purchased slacks to supplement the shirts issued in 1988 and 1989 and also issued both summer and winter caps.

Education

The Division's involvement in education continued to grow this year. The Massachusetts Junior Conservation Camp held its 38th session. As in the past, the Division handled pre-camp publicity, administration and registration of campers. During the camp season Division staff taught sessions on wildlife management, aquatic ecology and fish hatchery management. The Section also developed and administered the final examination and participated in the camp graduation exercises.



Progress continued with Project WILD as the program has grown throughout the Commonwealth and the nation. This year 33 facilitators conducted 40 workshops (25 terrestrial, 13 aquatic) and trained 551 teachers in the use of the WILD materials bringing the total number of WILD teachers in Massachusetts to 2180. Workshops were initiated for pre-service science teachers at Worcester State College and a ten-session course was held for the Munson school system. Special presentations were made to the Massachusetts Teachers Assn., the Boston Harbor Educators Conferenbce, an environmental leadership group at Tufts University and teachers of the Worcester Headstart Program. Three times during the year, a WILD newsletter was sent to all teachers who had participated in a WILD workshop.

The Division's educational outreach was enhanced with the addition of three new programs to this Section's activities. This year the Aquatic Resources Education Program became an active and integral part of the Education Section. Coordinator Gary Zima held three instructor training workshops adding 30 new instructors to the program and bringing the number of volunteer instructors to 178. These instructors offered 26 workshops (serving 587 students) and took part in 37 special one-day events which reached an estimated 6,424 people. In addition, program volunteers were involved in 15 fairs and exhibits reaching an estimated 3,000 with information about the opportunities offered by the program. New materials generated were a full color poster on salmonids of Massachusetts and a first draft of a brochure to introduce the prigram to the general public. To keep the instructors advised of events within the program and to maitain the esprit d'corps, the coordinator prepared six issues of the program newsletter, Shortcasts and corrdinated the 3rd annual Volunteer Appreciation Banquet.

The Division's involvement in the Massachusetts Envirothon increased. This is a special statewide "olympic-style" event in which students compete against teams from other schools. The focus of the competition is information about Natural Resources. Although Section staff had been peripherally involved with this program in FY 1989, the Section was fully involved in the planning and operation this year.

This year saw the formative stages of a new initiative, the Merrimack River Watershed Education Program. For some years the WILD coordinators had been seeking a vehicle to involve high school aged students in real investigations within their own communities. After a number of planning meetings with educators through the state, it was decided that the Merrimack River Watershed offered a perfect opportunity for such a project. A joint program was developed with the New Hampshire Fish and Game Dept. This program, now being pioneered in New Hampshire, involves students in testing of water quality, sharing information over a telecommunications network and then pulling the resultant information at a student-run congress. As Massachusetts is not yet at the operational stage, the I & E Chief participated in the New Hampshire congress and assured students of Massachusetts' support and interest.

Special Programs and Events:

Employees Conference: In response to staff demand, the Section once again hosted a Division-wide employees conference designed to familiarize staff with existing programs and inform them about new ones. This gathering also has the benefit that it provides an opportunity for networking and team building within the Division.

Desktop Publishing Seminar: Word processing is becoming more and more important in the operations of this Section. As more staff members have access to computers and have gained a basic familiarity with word processing techniques, the Section held two workshops in desktop publishing techiques. Familiarity with Pagemaker will enable Section staff to prepare camera-ready copy of materials which are gradually being converted to and prepared in word processing mode. This should enhance our publication capabilities while significantly reducing costs.

Fuertes Prints: A second edition of prints was prepared this year. The two new prints are "Loons" and "Small owls." Publicity materials on these new prints were developed and distributed.

Tags 'N'Trout: This program reached a new high in number of sponsors (37), number of stocked waters (49) and number of tagged trout (792). One new sponsor tagged 100 trout in Lake Quisigamond, Worcester. Tag returns averaged 62%.

Freshwater Sportfishing Awards: Emphasis in this program was placed on expanding the number of weighing stations. This effort was successful in the Connecticut Valley but had only limited success in the Western District. During this year some 663 pins were awarded to anglers taking excpetional fish in 20 categories.

New records were established for:

Channel Catfish: 26 lbs. 8 ozs.
taken by Dana Dodge of
Buckland

White Perch: 2 lbs. 15 ozs.
taken by Wayne Moniz Jr. of
Teaticket. This tied a record
set in 1988.

Information & Education Staff:

Ellie Horwitz, *Chief*
Bill Byrne
Priscilla MacAdams
Debbie McGrath
Dan McGuiness
Peter Mirick

DISTRICT REPORTS

Northeast District, Walter Hoyt, *Manager*
Southeast District, Louis Hambly, *Manager*
Central District, Chris Thurlow, *Manager*
Connecticut Valley District, Ralph Taylor, *Manager*
Western District, Tom Keefe, *Manager*

The five wildlife districts form the field presence of the Division of Fisheries and Wildlife, administering wildlife lands, conducting on-site management, and dealing with wildlife issues pertinent to their region.

Staff from the districts conduct fisheries and wildlife surveys and help to gather data for research programs. They conduct trout and pheasant release programs and release northern pike and tiger muskies where appropriate. They operate checking stations where sportsmen register deer, bear, turkeys and furbearers. They serve as liaison with conservation organizations, including sportsmen's clubs, within their district, conduct educational programs and respond to individual and media inquiries. Another key activity of District personnel is to provide advice and technical assistance to persons and/or other agencies dealing with wildlife problem situations. In this context, District staff deal with a large number of beaver complaints, deer damage complaints and other issues dealing with wildlife impacts on human habitations.

All district personnel distribute licenses, abstracts, stamps and other materials related to the sale of hunting/fishing/trapping licenses. They assist officers from the Division of Law Enforcement to assure public adherance to wildlife laws and regulations, and they assist the staff of the Division's Wildlife Lands Section in locating titles and landowners, and in making arrangements for the Division's aquisition of lands for wildlife.

During the past year District staff once again participated in numerous research programs including the mid-winter eagle survey, waterfowl inventory and banding, census of mourning doves, woodcock and quail, and a survey of great blue heron rookeries. They also monitored water quality of lakes and streams prior to releasing fish into them. District staff reviewed the Environmental Monitor for development projects that would affect wetland areas and provided technical advice on the control of environmental problems — particularly in the handling of nuisance animal situations. District managers served as the Division's public relations/education outreach, spending many hours with civic and sportsmen's groups and responding to inquiries from interested citizens.

All Districts offered programs which introduce visitors to the Division and its activities. All participated in the release of specially tagged fish through the Division's Tags'n'Trout program. All districts actively managed wildlife management areas in their region. This involved brushcutting, mowing, trimming trails, designing forest cutting opreations, planting shrubs and maintaining roads and parking areas. Additional maintainance was needed on nesting boxes placed on wildlife management areas for wood ducks, bluebirds and purple martins. Maintainence was also needed on Division buildings and vehicles.

In addition to the activities that are common to all of the Districts, there were certain projects which required the par-

ticipation of staff from only certain Districts.

Staff of the **Northeast District** monitored activities on eight WMAs, five sanctuaries and at six boat launching sites. They released 125,500 trout during the spring stocking period and another 5,680 trout during fall stocking. They also released pheasants and white hare. They designed and manned a booth at the Topsfield Fair and assisted in manning the Division's booth at the New England Sportsman's Show. Highlights of the year in this district included staff participation in the annual youth upland bird hunt, a partnership with the Essex County League, and the youth waterfowl hunt, a partnership with the Essex County League and the U.S. Fish and Wildlife Service, acquisition of 105 acres of wildlife land in Ashby, construction of 100 blubird boxes for the NHES Section, obtaining access to Long Sought for Pond in Westford, and continuation of the successful goose program at Jenks' Reservoir in Bellingham.

The Southeast District, which had been operating with reduced staffing, achieved full staffing in February 1990 with the advent of District Fisheries Supervisor Steve Hurley. Prior to that, and in the absence of a Fisheries Supervisor, staff had assisted in a statewide stream temperature monitoring project, conducted a stream survey on Puddingshear Brook, conducted fishkill investigations and obtained fish samples from the Wankinco River for the Dept of Environmental Protection. Staff had also conducted fall stocking releasing 3,000 trout, 2,000 northern pike and 1,200 tiger muskies.

In spring, with a fisheries supervisor on board, this District stocked an additional 110,000 trout and played an active role in the Tags 'n' Trout program releasing 272 tagged fish into 17 ponds and the Palmer River. The new fisheries supervisor assisted the Adopt-A-Stream program in meetings with the Taunton River Watershed Alliance and assisted Trout Unlimited with habitat improvements on the Quashnet River.

The District's wildlife habitat efforts were focussed primarily on the Crane WMA in Falmouth, the Myles Standish WMA in Plymouth and the Hockamock WMA in the Bridgewater/Raynham area. This involved cutting, mowing, top dressing of fields, trail maintenance, planting, erection and maintenence of signs and gates on nine Wildlife Management Areas. Pheasant and quail were stocked where suitable cover was available. District staff maintained some 200 nesting boxes for wood ducks, adding 20 new boxes and many new box tops and predator guards. Throughout the year District staff recorded sightings of wild turkeys on Cape Cod. It is speculated that these sightings are the result of the Division's release of 18 wild turkeys at the Otis/Edwards Military Reservation in March 1989. Two sightings of hen turkeys with poults were reported from the Miltary Reservation and a number of deer hunters participating in the special deer hunt at the Reservation, reported seeing turkeys.

Central District staff released 119,100 trout during spring and fall. They also stocked pheasants and white hare where suitable cover could be found. Wild turkeys, captured in the Berkshires, were released in Sutton. In addition to their regular duties, staff from this District conducted landlocked salmon and lake trout development studies at Wachusett Reservoir(?). Studies of brown trout carryover and growth potential were continued at Comet Pond, South Pond, Lake Quinsigamond and Wallum Lake. Additional studies at South Pond sampled the growth and harvest rates for northern pike.

Information signs and boundary markers were erected on all wildlife management areas as needed. Particular management projects were conducted on Birch Hill WMA, Bolton Flats WMA, Westboro WMA, Quaboag WMA, Quacum quasit WMA, High Ridge WMA and Winnemusset WMA.

District personnel tagged fish for nine Tags 'N' Trout locations. Staff set up and manned Division exhibits at the Eastern Fishing and Outdoor Show (Worcester) and at the Big E (Springfield). The District Manager continued to coordinate the scheduling for statewide pheasant stocking.

In addition to the usual District operations, staff of the Connecticut Valley District installed two 16 foot gates on the Swift River WMA and one at the Swift River Public Access Ramp. They constructed a new outbuilding to house the Division bulldozer and they p[rovided technical advice to towns and provate landowners regarding the installation and maintenance of beaver-proof water control culverts.

Staff from this District assisted staff of the Roger Reed Hatchery (Palmer) in taking eggs from Atlantic salmon and releasing salmon into tributaries of the Connecticut River. The staff also continued its tradition of taking an active role in the Massachusetts Junior Conservation Camp — providing a workshop on wildlife management techniques to campers and providing a "living history" approach to teaching about the importance of wildlife in the development of the nation

Staff from the **Western District** released more than 130,000 trout in addition to releasing northern pike, pheasants and white hare. Like all other Districts they staffed check stations, conducted stream surveys, fielded inquiries from the general public and handled wildlife nuisance complaints. Technical assistance was provided to local, county, State and Federal agencies involved with permitting or development.

Western District personnel took a leading role in the live trapping of wild turkeys for translocation to eastern areas. They also took an active role in locating and identifying several rare plant species. As in past years, this District prepared, coordinated and hosted the special deer hunt for paraplegic sportsmen.

District Personnel

Northeast District:
Walter Hoyt, Manager
Tom Sheehan, Game Manager
Peter Jackson, Fisheries Manager
Dave Ford
Lawrence Howie
Howard Kreiser
Matthew Majuri
Frank O'Meara

Southeast District:
Louis S. Hambly, Jr. Manager
Richard Turner, Game Manager
Steve Hurley, Fisheries Manager
(from 1/90)
Joseph Comick (to 9/89)
Ed Kraus
Richard Norton

Central District:
Chris Thurlow, Manager
Michael Ciborowski, Game Manager
Lee McLaughlin, Fisheries Manager
Dave Carlson, Birch Hill WMA Super.
Paul Le Boeuf
Arthur Myers
Paul Orrizzi
Al Ortiz

Connecticut Valley District:
Herman Covey, Manager (to 10/89)
Ralph Taylor, Manager (from 1/90)
Peter Pekkala, Game Manager
John O'Leary, Fisheries Manager
(from 1/90)
Barbara Bourque (from 4/90)
Gary Galas
John Nowakowski, Jr.
Martin Wrubel
James Wright

Western District:
Tom Keefe, Manager
Anthony Gola, Game Manager
Leo Daly, Fisheries Manager
Dale Beals
Elna Castonaguay
Joseph Kirvin
David St. James
Jerry Shampang

REALTY

William Minior
Chief, Wildlife Lands

Fiscal 90 was a very trying year because of the overall unstable financial situation of the Commonwealth. Acquisition and consultant funds were generally not available until approximately half way through the second half of the fiscal year. Most acquisitions recorded in FY90 represented closings on agreements made in FY89 and were charged against that year. However, twenty acquisitions protecting 1735 acres were recorded in FY90. Various non-profit environmental organizations including, Massachusetts Audubon, The Nature Conservancy and The Conservation Law Foundation assisted the Commonwealth on individual transactions. Two gifts were granted to DFW including 30 acres of valuable marshland in the Town of Marshfield, and a one (1) acre access to Glen Echo Lake in Charlton.

The Town of Wendell was successful in its efforts to protect over 400 acres of valuable wildlife habitat through Town purchase via Right of First Refusal under Chapter 61, with subsequent conveyance to the DFW. A considerable effort near the end of FY90 will result in a significant number of acquisitions in early 1991.

Western District

Six acquisitions added 282.6 acres of valuable habitat to the DFW's holdings in the Berkshires. Most acquisitions were water oriented with two tracts totalling over 100 acres having been added to the Hop Brook WMA, 56 acres added to the Hinsdale Flats WMA along the upper reaches of the Housatonic river and two lengthy sections of frontage having been acquired along the Middle Branch of the Westfield River in the Town of Chester. Two nongame areas including the Jug End Fen in Egremont and Maple Hill in West Stockbridge were given high priority by the NHESP and acquired. The Western District presently manages 17,824.35 acres of DFW holdings in twenty-one location.

Connecticut Valley District

Once again Valley acquisition efforts were geared toward the Satan's Kingdom WMA in Northfield and Bernardston. Three acquisitions totalling 459 acres of valuable wildlife haitat helped to link existing public open space and increased the protected acreage in Satan's Kingdom to nearly one thousand acres. The Town of Wendell acquired the 413 acre Wolfe Property under its Chapter 61 Right of First Refusal and transferred said tract to the DFW as the Wendell WMA. It offers a potential link to vast areas of State Forest. Rainbow Beach, a popular section of The Connecticut River shoreline in the Town of Northampton was acquired through assistance of Massachusetts Audubon for protection of a rare species of beetle, becoming the first R&E site in the Conn. Valley. Over 900 acres of valuable habitat was qcquired in the Valley in Fiscal 90.

Central District

The Central District was the beneficiary of two gifts which provided access and habitat. The twelve acre addition to the Division's Phillipston WMA increases this tract to over 3,740 acres, while a one acre gift provides access to Glen Echo Lake, an approximate one hundred acre warmwater fishery in the Town of Charlton. A 140 acre acquisition from The Conservation Law Foundation, Inc. provided considerable acreage and extensive Ware River frontage in the Town of New Braintree. Acquisition of the former Slein property also in New Braintree filled an increasingly important gap in the Winimusset WMA, while providing approximately one hundred acres of diverse habitat, including wooded upland, meadows, fields and considerable frontage on Winimussett Brook, a valuable coldwater stream.

Northeast District

Although only one parcel was recorded for the NE District in FY90, negotiations and ground work on many other valuable tracts were accomplished. The one half acre tract acquired ends a two and one half decade effort to acquire and provide access to Long Sought For Pond in the Town of Westford. This is one of the premiere trout ponds in the NE District and a heavily utilized resource. In addition to providing canoe and cartop access, approximately three hundred feet of shoreline is included with this tract.

Southeast District

A 30 acre gift to the DFW of valuable and productive North River salt marshes was a most welcome addition in the Town of Marshfield, and will be called the English Salt Marshes. The donor intends to convey additional and abutting marsh in the near future. A fourteen acre tract along Harlow Pond, a Coastal Plain Pond containing three rare plant species was acquired in the Town of Plymouth. A two hundred and seven acre tract was purchased from Acushnet Saw Mills, adding substantially to existing open space in this section of Fall River. The acquisition of two "fingers" in the Crane WMA ends an approximate thirty year quest to acquire these parcels. Further acquisitions will follow, providing a necessary buffer to our existing area.A summary of activity is attached.

Western District

Expended	$296,286.00
Acreage	282.6
Cost per Acre	$1,048.43

Valley District

Expended	$830,954.50
Acreage	903.4
Cost per Acre	$ 919.81

Central District

Expended	$469,400.00
Acreage	252
Cost per Acre	$ 1,862.70

Northeast District

Expended	$40,000.00
Acreage	.5
Cost per Acre	$80,000.00

Southeast District

Expended	$961,494.28
Acreage	296.5*
Cost per Acre	$ 3,242.81*

TOTAL Expended:	$ 2,598,134.78
TOTAL Acreage Acquired:	1,735
Average Cost per Acre:	$1,497.48

*Includes departmental acquisitions

It should be noted that only the acreages and costs of those properties RECORDED in FY1990 are utilized herein.

Total Acreage by Area Type

Wildlife Mgt. Areas - 57
53,682.49 acres

Wildlife Sanctuaries - 13
1,236.0 acres

Fish Hatcheries - 5
629.3 acres

Game Farms - 3
373.9 acres

Streambank - 22
2,959.34 acres

Salt Marsh - 3
388.05 acres

Lake & Pond Access - 13
82.92 acres

Fisheries Wildlife Acres - 1
72.0 acres

Nongame Areas - 12
641.85 acres

Other* - 18
839.0 acres

GRAND TOTAL: 60,904.85 acres

*Includes: Pond Systems, Military Lands, Forest Areas, Wildlife Districts, Islands, and Hatchery Land, MDC/F&W Area and Marsh Management Area.

MAINTENANCE and DEVELOPMENT

STEVEN HENRY
Senior Planner

Hatcheries and Game Farms

Five buildings at the Ayer Game Farm have been re-shingled. These include a small hatch house, residnece, garage, shop and an out-building. The wiring of the standby generator was completed.

The garage at the Sunderland Trout Hatchery was re-shingled.

Districts and Field Headquarters

Eleven of the Divisions underground gasoline storage tanks have been removed. There are three gas tanks remaining in service; one a McLaughlin State Fish Hatchery and two at the Westboro Field Headquarters. Most of the Division's tanks were over thirty years old and presented potential hazardous situations.

All of the Division's hazardous materials, which have accumulated over the years and stored at the various installations, have finally been removed and disposed of. This is a culmination of many peoples efforts to coordinate funding, vendors and disposal sites. As a result, the Division has disposed of 15-20 years worth of small quantity hazardous waste materials.

The boiler/furnace system was replaced at the Central District office. Also, the office building was re-roofed; a flat roof, rubber mambrane type roofing system was installed.

The west Meadows WMA gravel roadway was reconstructed in the Southeast District. Four garage doors at the District office were replaced. Two metal storage buildings were also painted at the District Headquaters.

Three garage doors were replaced at the Martin Burns Wildlife Area headquarters.

The Westboro Field Headquarters contract the Assabet Valley Vocational School (woodwroking department) to contruct badly need storage areas. They also construct new offices in the East wing of the basement. The electrical department upgraded the Headquarters' electrical service throughout the building. Additional outlets, lighting and service was installed.

FEDERAL AID

R. Stewart MaCaig
Administrator, Federal Aid Program

The Federal Aid Coordinator directed much of his effort during the year toward monitoring utilization of continually-increasing federal funds, in particular those available for sport fish restoration work. The U. S. Dept. of Interior annual 1990 apportionment of Dingell-Johnson excise revenue collections will allow the state up to $1,798,000 that may be used by the DFW and the DMF in the ratio 52.7 to 47.3, respectively. The ratio is prescribed on the basis of the number of resident anglers who participate in freshwater and saltwater sport fishing, as determined through a statistically reliable method - in this case the National Survey of Fishing, Hunting and Wildlife-Associated Recreation. Pittman-Robertson apportioned funds totalled $1,111,341, of which up to 56% is optionally applicable for use hunter education. As of 7/1/90, federal funds encumbered in active freshwater research, development, technical assistance, education, and coordination projects amounted to $974,250 in the D-J Program, $1,407,375 (including $393,000 associated with hunter education) in the P-R Program, and $19,000 for endangered species restoration. The federal share of active saltwater projects amount to $467,625. In addition to the foregoing, three large land acquistion projects in Ashland and Williamstown currently encumber $1,095,000 of federal money, and an access development project in Weymouth obligates $270,000 more. Sport fish and Wildlife apportionments are available for use on approved projects during the year declared and until the close of the following fiscal year, Sept. 30.

The coordinator also provided assistance to Division administrators in formulation of interagency service agreements with the Univ. of Mass, Amherest, for work conducted by the Fish and Wildlife Cooperative Research Unit of deer, bear, furbearing wildlife, shad and salmon in the Conn. and Merrimack rivers, management of the federally-listed endangered piping plover, forest-wildlife development work, and experimental control of acidity in Whetstone Brook, Wendell; also for acid rain investigations by the University's Water Resources Research Center. He assisted DMF administrators in recovery of federal reimbursements and worked with the DLE Hunter Education Coordinator in planning for development of a shooting range on grounds adjacent to the Training Center, located on the High Ridge WMA in Gardener. During the year, newly-appointed personnel filled Assistant Director vacancies in both the Fisheries and Wildlife Sections, and the coordinator familiarized these individuals with sectional responsibilities that enable them to continue their federal aid programs.

During the week Oct. 16-19, the Coordinator attended the annual Federal Aid Regional Meeting, held this year at Vergennes, Vermont, for coordinators of 13 states and the District of Columbia that comprise the Fish and Wildlife Service Northeast Region. In January, the Federal Aid secretary and bookkeeper, Mrs. Mary Berberian, retired, and the Coordinator assumed her duties pending assignment of her replacment. In early February, state Audit Dept. personnel began an examiation of federal aid records for the four-year period 1986 to 1989, and the services of the Coordinator were continually required by auditors to provide file material and other information throughout the remaining five months of the fiscal year.

LEGISLATIVE REPORT

Fiscal Year 1990

Chapter 240. July 13, 1989

Section 122. Inserted in Chapter 63 a new section 38L that permits that every corporation that files a tax return may voluntarily contribute all or part of any refund to which it is entitled or may voluntarily add an amount onto any amount due to be credited to the Natural Heritage and Endangered Species Fund.

Chapter 652. Januery 3, 1990. An Act Relative to the Establishment of Nature Preserves.

Chapter 653. January 4, 1990. An Act Establishing the Budget Control and Reform Act of 1989.

Section 22. Increased the non-criminal fines and made changes in the offenses that could be cited under Chapter 21.

Section 93. Increased fines issued under Chapter 131 and required that the violator make restitution to the Commonwealth for each animal taken.

PERSONNEL REPORT 1990

NEW HIRES
David Basler, Jr. - 11/26/89 - Fish Culturist Asst.
James Wright - 1/2/90 - Laborer I
Steve Hurley - 1/2/90 - Fisheries Supervisor
John O'Leary - 1/2/90 - Fisheries Supervisor
Daniel Lanier - 3/25/90 - Laborer I (seasonal)
George Skaza - 4/8/90 - Laborer I (seasonal)
Jon Sojka - 4/8/90 - Laborer I (seasonal)
Alan Jackson - 4/15/90 - Laborer I
Matthew Majuri - 4/15/90 - Laborer I
Karl Hansen - 4/15/90 - Laborer I
Priscilla Cancellieri - Bookkeeper I
Barbara Bourque - 4/29/90 - Clerk II
James Guthrie - 4/29/90 - Laborer II (seasonal)
Melinda Bilodeau 5/1/90 - Laborer I (seasonal)
Annemarie Averill - 5/2/90 - Laborer I (seasonal)
Steven Oatis - 5/14/90 - Laborer I (seasonal)
Helen Yung - 5/20/90 - Bookkeeper I
Michael Pietila - 5/20/90 - Laborer I (seasonal)
Amy Derosier - 5/20/90 - Laborer I (seasonal)
Steven Johnson - 5/29/90 - Laborer I (seasonal)
Matthew Trainor - 6/4/90 - Laborer I (seasonal)
Diane Lauber -n 6/10/90 - Clerk IV

PROMOTIONS
Ralph Taylor - 1/2/90 - District Fish & Game Supervisor
Edward Siwicki - 1/7/90 - Laborer II
Mark Tisa - 5/6/90 - Program Manager IV

VOLUNTARY DEMOTIONS
Marion Larson - 3/11/90 - Information Officer I
Susan Langlois - 6/17/90 - Wildlife Technician

LEAVE OF ABSENCE
James Polk - 9/28/89 - Laborer I
Steve Hurley - 1/2/90 - Fisheries Supervisor
John O'Leary - 1/2/90 - Fisheries Supervisor

MISCELLANEOUS
Anita Masterson - 11/13/89 - Clerk IV (Re-classification)
Nancy Limosani - 9/3/89 - Clerk V (Full-time)
Mary Hamlin - 9/5/89 - Typist II (Part-time)
Priscilla MacAdams - 9/5/89 - Typist II - (Full-time)
Jay Copeland - 5/1/89 - Env. Analyst (Re-classification)
Richard Norton - 9/25/88 - Laborer II
Marcia Hartleb - 9/13/89 - Typist II - Perm. Cert.
Charles MCLaughlin - 4/3/90 - Laborer I (Certified Position)
Ruthann Surrette - 3/11/90 - Bookkeeper I (Certified Position)

TERMINATIONS
John Irminger - 7/1/89 - Laborer I (Seasonal)
Paul Grimley - 7/1/89 - Laborer I (Seasonal)
Mark Kucenski - 7/1/89 - Laborer I (Seasonal)
Robert Bruce - 7/15/89 - Laborer I (Seasonal)
James Lear - 7/15/89 - Laborer I (Seasonal)
Stephen Johnson - 8/18/89 - Laborer I (Seasonal)
Albert Leach - 8/26/89 - Laborer I
Matthew Trainor - 8/26/89 - Laborer I (Seasonal)
Steven Oatis - 8/26/89 - Laborer I (Seasonal)
Joseph Comick - 9/30/89 - Laborer I
James Guthrie - 11/25/89 - Laborer II (Seasonal)
Mary Cavaliere - 12/2/89 - Bookkeper I
George Skaza - 4/26/90 - Laborer I (seasonal)
Peter Burns - 5/26/90 - Assistant Fish Culturist
Michael Pietila - 6/30/90 - Laborer I (seasonal)
Amy DeRosier - 6/30/90 - Laborer I (seasonal)

RETIREMENT
John Gromaski - 7/7/89 - Laborer II 35 years of service
Mary Berberian - 12/30/89 - Bookkeeper II 32 years of service
Howard Kreiser - 6/30/90 Laborer II 13 years of service

DECEASED
Herman Covey - 10/31/89 - District Fish & Game Supervisor 38 years
Peter Oatis 2/15/90 - Program Manager IV 20 years

Financial Staff:
Nancy Melito
Assistant Director, Financial Affairs

Priscilla Cancellieri
Mary Cavaliere
Lillian Hew
Yunus Khalifa
Nancy Limosani
Carl Lui
Mary Lou Raples
Elizabeth Sienczyk
Ruthann Surrette

How the Sportsmen's Dollar was Spent

CATEGORY	**ACCOUNT #**	**EXPENDITURE**	**PERCENTAGE**
Administration			
Administration	2310-0200	604,596	
Information & Education	2310-0200	313,217	
Subtotal		917,813	12.43
Fishkill Invest.	**2310-0313**	**71,911**	.97
Wildlife Programs			
Game Farm	2310-0200	199,431	
Wildlife Mgt.	2310-0200	883,476	
Wild. Coop.Unit	2310-0313	31,081	
Wild. Coop.Unit	2310-0200	50,984	
Subtotal		1,164,972	15.77
Fisheries Programs			
Hatcheries	2310-0200	1,031,710	
Fisheries Mgt.	2310-0200	1,115,423	
Fish. Coop.Unit	2310-0313	30,719	
Fish. Coop.Unit	2310-0400	39,273	
Acid Rain Prog.	2310-0313	200,074	
Subtotal		2,417,199	32.73
Construction			
Facilities	2310-0313	109,395	
Equipment	2310-0313	257,683	
Magazine	2310-0312	109,176	
Hunter Safety	2350-0101	155,542	
Other Adm. & Oper.	2310-0313	111,885	
Shellfish	2330-0100	77,244	
Subtotal		820,925	11.11
Split Fund Accounts			
Nat. Heritage*	2310-0500	84,844	
Law Enforcement**	2350-0100	786,088	
Subtotal		870,932	11.79
OTHER ASSESSMENTS			
Retirement (.2%)	0612-1000	644,000	8.72
TRANSFERS FROM FUND			
Group Ins.	1590-1007	421,251	
Debt. Service		50,000	
Interest		4,600	
Ret. Adjust.		3,000	
Subtotal		478,851	6.48
TOTAL EXPENDITURES		7,386,603	100.00

* 50% Nongame Wildlife Fund
50% Inland Fish and Game Fund

** 15% Inland Fish and Game Fund

Expenditures
Other Funds and Programs
July 1, 1989 to June 30, 1990

Trust Funds

Account No.	Activity	Expenditures
2310-6006	Bald Eagle Trust II	34
2310-6007	Bald Eagle Trust III	6,657
		6,691

Federal Grants

Account No.	Activity	Expenditures
2310-9701	Whetstone Brook Project	34,236

Nongame Wildlife Fund

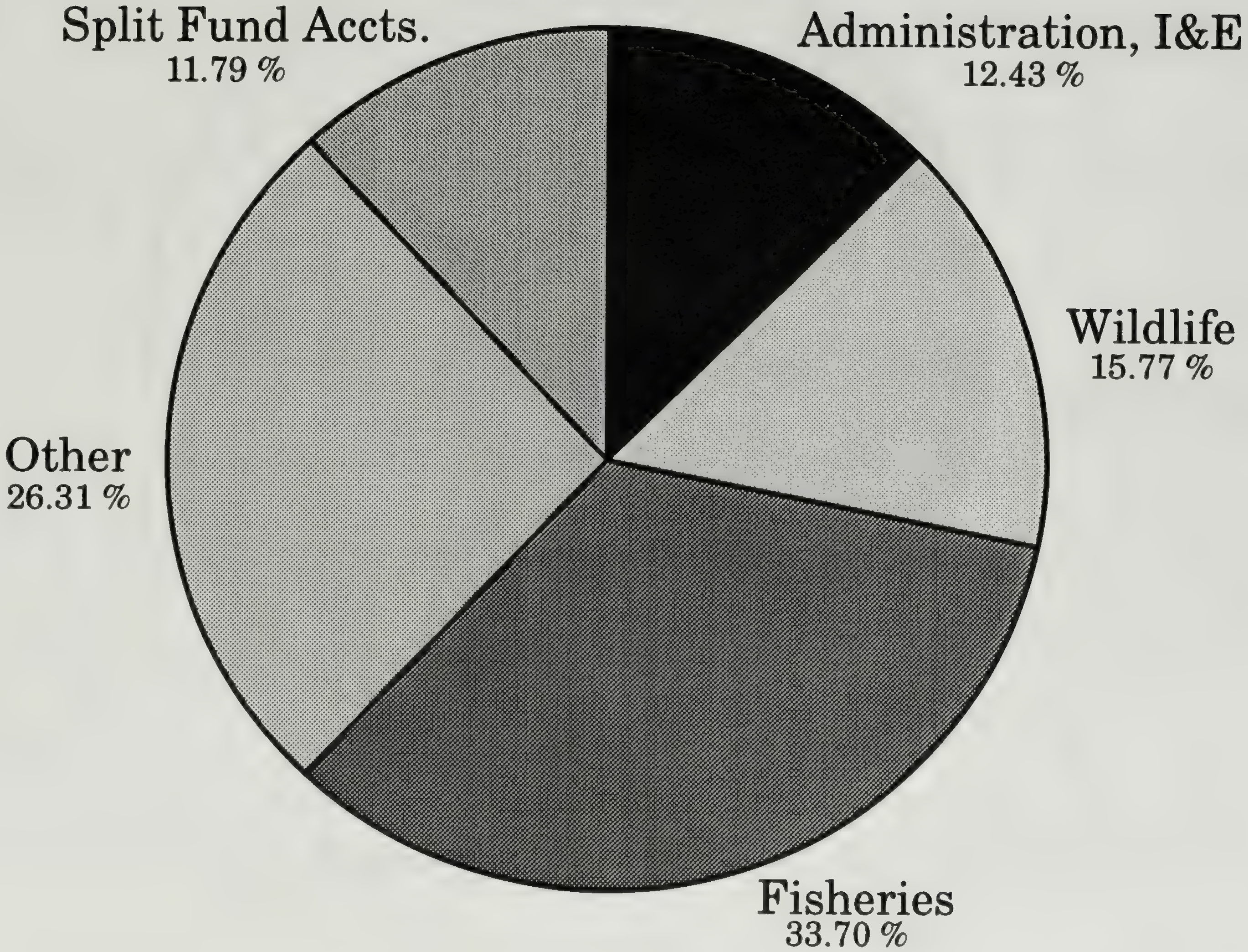
Account No.	Activity	Expenditures
2315-0100	Administration	284,200
2310-0314	Retained Revenue Account	12,058
1595-0043	Fringe/Indirect Costs	36,073
2310-0500*	Natural Heritage Program	84,843
		417,174

Capital Outlay Funds

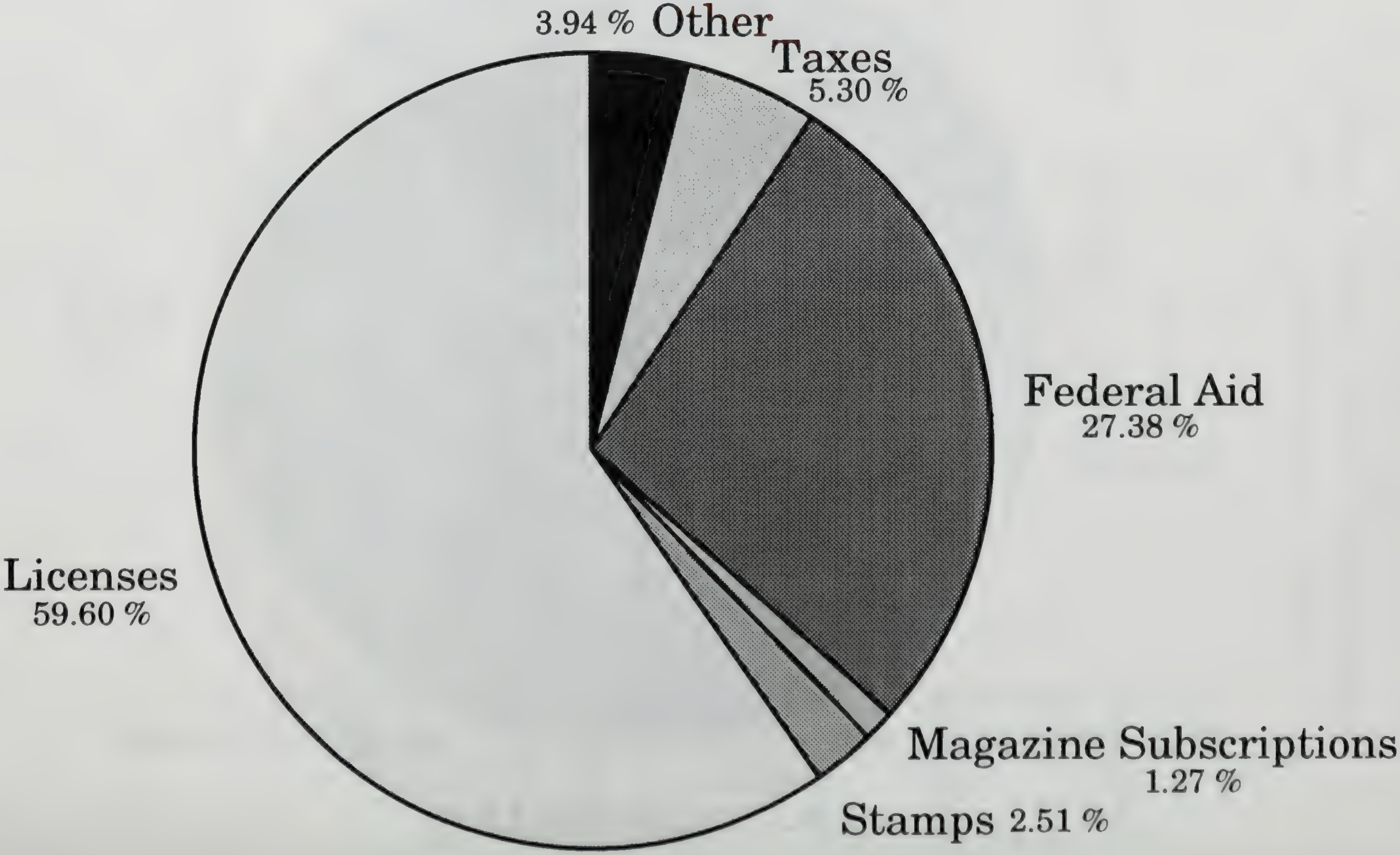
Account No.	Activity	Expenditures
1102-7804	Building Demolition	0
2310-7880	Hatchery Recons.(Sunderland)	0
2310-7881	Fuel tank Removal (Statewide)	35,058
2310-7890	Well Repair (Sandwich)	0
2310-7891	Repairs (Sandwich)	0
2310-8840	Land Acq. (Cold Water Streams)	995,895
2310-8841	Associated Costs (8840)	121,908
2310-8842	Land Acq. (Adjacent Lands)	2,190,916
2310-8843	Associated Costs (8842)	95,124
2310-9845	Fuel Tank Removal (Bourne)	126,227
2310-9848	Toxic Substance Removal	0
		3,565,128

* 50% Nongame Wildlife Fund
50% Inland Fish and Game Fund

Expenditures



Income


3.94 % Other
Taxes 5.30 %
Federal Aid 27.38 %
Magazine Subscriptions 1.27 %
Stamps 2.51 %
Licenses 59.60 %

Summary
Revenue, Other Financing Sources, Reversions
Inland Fish and Game Fund
July 1, 1989 to June 30, 1990

COLLECTED BY AGENCY	Amount
Fishing, Hunting & Trapping Licenses	4,417,916.40
Archery Stamps	154,469.10
Trap Reg.	1,050.50
Waterfowl Stamps	8,631.15
Waterfowl Stamps/DU	29,624.60
Special Licenses, Tags & Posters	17,059.00
Antlerless Deer Per.	59,428.00
Bear Permits	6,948.00
Turkey Permits	61,182.00
Rents	36,849.00
Sales, Other	14,661.00
Misc. Income	18,891.00
Magazine Subscript.	97,722.00
Shellfish Purification*	113,216.00
Subtotal	5,037,647.75
COLLECTED BY STATE TREASURER	
Fines and Penalties	56,015.00
Interest	0
Subtotal	56,015.00
FEDERAL AID	
Pittman-Robertson	911,664.00
Dingell-Johnson	730,091.00
Endangered Species	4,875.00
Indirect Cost Reimbursement	449,616.00
Subtotal	2,096,246.00
TAXES	
Gasoline Tax	406,000.00
TOTAL REVENUE:	7,595,908.75
Transfers from General Fund	
Reimbursement/Half Price Licenses	61,000.00
TOTAL OTHER FINANCIAL SOURCES	61,000.00
TOTAL REVENUE AND OTHER SOURCES	7,656,908.75
FUND EQUITY AS OF JUNE 30,1990	3,582,000.00

Summary of License Sales FY 90

TYPE LICENSE	UNIT PRICE	QUANTITY	AMOUNT
Res. Cit. Fishing	$ 12.50	177,011	2,212,637.50
Res. Cit. Minor Fishing	$ 6.50	6,941	45,116.50
Res. Cit. Fish (65-69)	$ 6.25	6,464	40,400.00
Res. Cit. Fish (Blind-Para)	FREE	4,576	
Res. Alien Fishing	$ 14.50	3,084	44,718.00
Non-Res Alien Fish Cit.	$ 17.50	10,301	180,267.50
Non-Res Alien Fish (7 day)	$ 11.50	3,107	35,730.50
Res. Cit. Trapping	$ 20.50	474	9,717.00
Res. Cit. Trapping Minor	$ 8.50	29	246.50
Res.Cit. Trapping (65-69)	$ 10.25	37	379.25
Non-Res Trapping	$ 300.00	0	0.00
Duplicate Fishing	$ 2.00	1.371	2,742.00
Duplicate Trapping	$ 2.00	15	30.00
Res. Cit. Hunting	$ 12.50	38,517	481,462.50
Res. Cit. Hunting (65-69)	$ 6.25	644	4,025.00
Res. Cit. Hunting (Para)	FREE	221	
Res. Alien Hunting	$ 19.50	957	18,661.50
Non-Res.Cit./Alien Big Game	$ 48.50	1,710	82,935.00
Non-Res.Cit./Alien Sm. Game	$ 23.50	1,340	31,490.00
Non-Res.Cit./Alien Comm. Sh. Pres. (3 day)	$ 19.50	364	7,098.00
Res. Cit. Sporting	$ 19.50	66,027	1,287,526.50
Res. Cit.Sporting (65-69)	$ 9.75	2,960	28,860.00
Res. Sporting (Over 70)	FREE	19,341	
Duplicate Hunting	$ 2.00	562	1,124.00
Duplicate Sporting	$ 2.00	1,996	3,992.00
TOTAL LICENSE SALES		348,049	4,519,159.25
Archery/Primitive Firearm Stamp	$ 5.10	30,910	157,641.00
Sales to Collectors		0	0
Collection of Bad Debt			31,774.15
Fees Retained by Clerks			(136,188.90)
Trap Registrations*			1,050.50
Waterfowl Stamps	1.25	21,900	27,375
Fees Retained by Clerks			(5,516.45)
Sales to Collectors			16,474.75
Refunds to Collectors			(77.55)
Total Net License & Stamp Sales			4,611,691.75

A J BOOKBINDER

JUL 1993

WALTHAM, MA [illegible]54
(617) 893-3051